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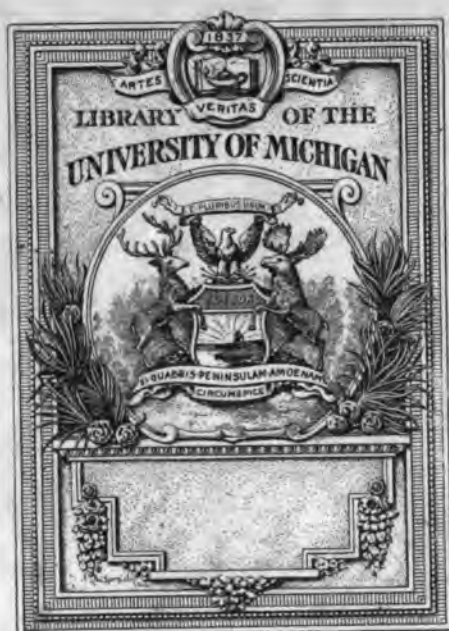
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**KANSAS**

**HORTICULTURAL REPORT,**

**FOR THE YEAR 1884.**

**CONTAINING THE**

**PROCEEDINGS OF THE STATE HORTICULTURAL SOCIETY AT ITS FOUR-  
TEENTH SEMI-ANNUAL MEETING, HELD AT JUNCTION CITY,  
DAVIS COUNTY, JUNE 4 AND 5, AND THE EIGHTEENTH  
ANNUAL MEETING, HELD AT BURLINGAME, OSAGE  
COUNTY, DEC. 16, 17 AND 18, 1884.**

**EDITED BY THE SECRETARY.**

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**VOL. XIV.**

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**PUBLISHED BY THE SOCIETY.**



**TOPEKA, KANSAS:**

**KANSAS PUBLISHING HOUSE: T. D. THACHER, STATE PRINTER.  
1885.**



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## FRUIT DISTRICTS.

### No. 1—NORTHERN DISTRICT.

(Embraces the following counties.)

ATCHISON,	GOVE,	OSBORNE,	SHAWNEE,
BROWN,	GRAHAM,	OTTAWA,	SHERIDAN,
CHEYENNE,	JACKSON,	POTTAWATOMIE,	SHERMAN,
CLAY,	JEWELL,	PHILLIPS,	SMITH,
CLOUD,	JEFFERSON,	RAWLINS,	ST. JOHN,
DAVIS,	LEAVENWORTH,	REPUBLIC,	THOMAS,
DECATUR,	LINCOLN,	RILEY,	TREGO,
DICKINSON,	MARSHALL,	ROOKS,	WALLACE,
DONIPHAN,	MITCHELL,	RUSSELL,	WASHINGTON,
ELLIS,	NEMAHA,	SALINE,	WYANDOTTE.
ELLSWORTH,	NORTON,		

### No. 2—CENTRAL DISTRICT.

(Embraces the following counties.)

ANDERSON,	GRAY,	LYON,	RENO,
BARTON,	GREELEY,	MARION,	RICE,
CHASE,	HAMILTON,	MCPHERSON,	RUSH,
COFFEY,	HARVEY,	MIAMI,	SCOTT,
DOUGLAS,	HODGEMAN,	MORRIS,	STAFFORD,
EDWARDS,	JOHNSON,	NESS,	WABAUNSEE,
FINNEY,	LANE,	OSAGE,	WICHITA.
FRANKLIN,	LINN,	PAWNEE,	

### No. 3—SOUTHERN DISTRICT.

(Embraces the following counties.)

ALLEN,	COMANCHE,	HARPER,	SEDGWICK,
ARAPAHOE,	COWLEY,	KANSAS,	SEWARD,
BARBER,	CRAWFORD,	KINGMAN,	STANTON,
BOURBON,	EDWARDS,	LABETTE,	STEVENS,
BUTLER,	ELK,	MEADE,	SUMNER,
CHAUTAUQUA,	FORD,	MONTGOMERY,	WILSON,
CHEROKEE,	GRANT,	NEOSHO,	WOODSON.
CLARK,	GREENWOOD,	PRATT,	

OFFICERS AND STANDING COMMITTEES FOR 1885.

OFFICERS.

**President,**

PROF. E. GALE, MANHATTAN, RILEY COUNTY.

**Vice President,**

M. B. NEWMAN, WYANDOTTE, WYANDOTTE COUNTY.

**Secretary,**

G. C. BRACKETT, LAWRENCE, DOUGLAS COUNTY.

**Treasurer,**

F. WELLHOUSE, FAIRMOUNT, LEAVENWORTH COUNTY.

**Trustees,**

NORTHERN DISTRICT, DR. CHAS. WILLIAMSON, Washington, Washington County.

CENTRAL DISTRICT, E. P. DIEHL, Olathe, Johnson County.

SOUTHERN DISTRICT, L. A. SIMMONS, Wellington, Sumner County.

STANDING COMMITTEES.

**Nomenclature,**

G. C. BRACKETT, LAWRENCE; H. E. VAN DEMAN, GENEVA; F. WELLHOUSE, FAIRMOUNT.

**Botany and Vegetable Physiology,**

PROF. JOHN W. ROBSON, CHEEVER.

**Entomology,**

A. N. GODFREY, MADISON.

**Orchard Culture,**

F. WELLHOUSE, FAIRMOUNT.

**Forestry,**

NORTHERN DISTRICT, HON. M. ALLEN, Hays City; SOUTHERN DISTRICT, J. B. SCHLICHTER, Sterling.

**Small Fruits,**

JUDSON WILLIAMS, OTTAWA; B. F. SMITH, LAWRENCE; F. HOLSINGER, ROSEDALE.

**Floriculture,**

MRS. E. E. FULLER, OTTAWA.

**Vegetable Gardening,**

GEO. W. ASHBY, CHANUTE; H. MANWARING, LAWRENCE.

**Handling Fruits,**

S. HATCH, WATHENA.

**Meteorology,**

PROF. F. HAWN, LEAVENWORTH; PROF. JOHN H. WOLFE, WELLINGTON.

**Vine Culture,**

JACOB WEIDMAN, PLEASANT VALLEY.

**Landscape Gardening,**

G. Y. JOHNSON, LAWRENCE.

**Horticulture Connected with Farming,**

E. P. DIEHL, OLATHE.

**Geology,**

L. A. SIMMONS, WELLINGTON.

**Ornithology,**

PROF. F. H. SNOW, STATE UNIVERSITY.

**Needed Legislation,**

L. A. SIMMONS, WELLINGTON; E. P. DIEHL, OLATHE.



## LIST OF MEMBERS.

## HONORARY MEMBERS.

(Enrolled in the order of admission.)

COL. N. J. COLMAN, . . . . .	St. Louis, Mo.	PROF. JOHN H. TICE, (dec.) . . . . .	St. Louis, Mo.
DR. L. D. MORSE, . . . . .	St. Louis, Mo.	SAMUEL MILLER, . . . . .	Bluffton, Mo.
C. W. MURTFELDT, . . . . .	St. Louis, Mo.	PROF. S. T. KELSEY, . . . . .	Highlands, N. C.
WM. KING, . . . . .	St. Louis, Mo.	PROF. F. H. SNOW, State Uni- versity, . . . . .	Lawrence.
DR. JOHN A. WARDER, (dec.) . . . . .	North Bend, O.		
PROF. C. V. RILEY, . . . . .	Washington, D. C.		

## LIFE MEMBERS.

(In the order and year enrolled.)

G. C. BRACKETT, . . . . .	Lawrence, 1868.	J. A. MOSHER, . . . . .	Belleville, 1879.
DR. WM. HOWSLEY, (dec.) . . . . .	Leavenworth 1875.	E. P. DIEHL, . . . . .	Olathe, 1880.
C. G. WICKERSHAM, . . . . .	Parsons, 1876.	JAMES MARVIN, D. D., . . . . .	Lawrence, 1880.
DR. J. M. DEBALL, . . . . .	Fontana, 1876.	HON. T. C. HENRY, . . . . .	Abilene, 1880.
PROF. E. GALE, . . . . .	Manhattan, 1876.	GEO. T. FAIRCHILD, A. M., Pres. Agricultural College, }	Manhattan, 1880.
H. E. VAN DEMAN, . . . . .	Geneva, 1876.	CHARLES A. DOW, . . . . .	Burlington, 1881.
SECRETARY'S OFFICE, MANHATTAN HORTICULTURAL SOCIETY, . . . . .	1876.	J. V. RANDOLPH, . . . . .	Emporia, 1881.
FRED. WELLHOUSE, . . . . .	Fairmount, 1877.	WM. MAXWELL, (dec.) . . . . .	Edgerton, 1881.
ABNER ALLEN, . . . . .	Wabauensee, 1877.	JOHN CLOUGHERLY, . . . . .	Parsons, 1882.
SECRETARY'S OFFICE, JOHNSON CO. HORTICULTURAL SOCIETY, . . . . .	1877.	JOHN S. HICKS, . . . . .	Roslyn, N. Y., 1882.
GEO. Y. JOHNSON, . . . . .	Lawrence, 1878.	E. P. HARRIS, . . . . .	Lecompton, 1882.
ROBERT MILLIKEN, . . . . .	Emporia, 1878.	ED. BILLINGS, . . . . .	Prescott, 1883.
A. A. ADAMS, . . . . .	Garnett, 1878.	CHAS. REYNOLDS, D. D., . . . . .	Junction City, 1884.
W. E. FOSNOT, . . . . .	Little River, 1878.	B. WOODWARD, M. D., . . . . .	Ottawa, 1884.
DR. J. STAYMAN, . . . . .	Leavenworth 1879.	PROF. E. A. POPENOE, Agri- cultural College, . . . . .	Manhattan, 1884.
A. N. GODFREY, . . . . .	Eureka, 1879.		

## ANNUAL MEMBERS FOR 1885.

## LADIES' LIST.

EASTER, Mrs. A. M., . . . . .	Burlingame.	KIRBY, Mrs. H. M. T., . . . . .	Burlingame
GRISWOLD, Mrs. C. C., . . . . .	Burlingame.	LEAR, Mrs. E. S., . . . . .	Burlingame

## GENTLEMEN'S LIST.

ALLEN, ABNER, † . . . . .	Wabauensee.	BOGGS, THEO., † . . . . .	McPherson.
ALLEN, M., † . . . . .	Hays City.	BOHRER, DR. G., † . . . . .	Chase.
ANDERSON, DR. J. J., † . . . . .	Custer.	BOWEN, A., * . . . . .	Olathe.
ASHBY, GEO. W., † . . . . .	Chanute.	BOWEN, P. C., † . . . . .	Cherryvale.
ATKINSON, J. P., † . . . . .	Crestline.	BOWER, SOL., † . . . . .	Olivet.
BAIRD, JAS., † . . . . .	Lenora.	BOYLE, JOHN F., † . . . . .	Nathan.
BANKER, J. A., † . . . . .	Salina.	BOYS, ROBT., † . . . . .	Whitfield.
BEATES, G. E., . . . . .	Junction City.	BROWN, G. B., † . . . . .	Gulldford.
BARNES, W. E., . . . . .	Vinland.	BROWN, H. L., † . . . . .	Ivernay.
BEAL, J. A., † . . . . .	Louisville.	BUCKMAN, THOS., † . . . . .	Topeka.
BECKER, M. J., † . . . . .	Fort Scott.	BURROUGH, C. N., † . . . . .	Zurich.
BESTER, F. W., † . . . . .	Pawnee Rock.	BUTLER, VAN E., † . . . . .	Delphos.
BIDWELL, J. W., † . . . . .	Wellmanville.	BYRAM, E. T., † . . . . .	Jewell City.
BISHOP, L., † . . . . .	Osawatomie.	BYRAM, J. W., † . . . . .	Cedar Point.
BLAIN, J. W., † . . . . .	Manhattan.	CHAPMAN, D. L., † . . . . .	Clay Center.

\*Delegate. †County Vice President.

## GENTLEMEN'S LIST.

CHASE, R. C.,	Hiawatha.	KNODLE, J. W.,†	Dickeyville.
CHEVALIER, C. C.,†	Garfield.	KOKENOUR, S. B.,	Manhattan.
CLARK, J. G.,†	Waveland.	KRITCHFIELD, W. B.,†	Wakeeney.
COLEY, H. S.,†	Oswego.	LANGWORTHY, S. B.,*	Leavenworth.
COLLAR, M.,†	Dodge City.	LATIMER, J. W.,†	Pleasanton.
COLVIN, W. J.,†	Larned.	LEACH, JOS.,†	Havensville.
CORBETT, J. B.,†	Bunker Hill.	LEACH, L. W.,†	Kingman.
COOK, THOS. F.,†	Menrovia.	LEWIS, S. D.,†	Elk Falls.
CRUMLINE, M.,*	Junction City.	LIPP, H. W.,†	Roseville.
CUTTER, WM.,†	Junction City.	LITSON, W. H.,†	Benton.
DAVIS, COL. JOHN,	Junction City.	LOY, J. W.,†	Americus.
DAVIDSON, S. P.,†	McGregor.	MARTIN, J. F.,*	Winfield.
DAY, ROBT.,†	Lyons.	MARVIN, T. B.,	Olathe.
DIEHL, E. P.,†	Olathe.	MCCARTNEY, J. S.,†	Garnett.
DEMING, N. P.,	Lawrence.	McLAREN, J. W.,†	Summerville.
DIMOCK, A. S.,†	Hutchinson.	MCCRACKEN, WM.,†	Sunny Dale.
DOILE, JAS. H.,*	Emporia.	McKEE, JOHN,†	Reedsville.
DOBBS, J. B.,†	Antelope.	McNEILL, C. G.,†	Stafford.
DOW, CHAS. A.,†	Hartford.	MEAD, IRA,*	Burlingame.
DOYLE, D.,*	Oswego.	MEANS, SAM.,†	Norton.
DUBOIS, H.,†	Burlingame.	MEARS, W. H.,†	Peabody.
EASON, FRED.,*	Leavenworth.	MEASER, J. J.,†	Hutchinson.
EASTER, A. C.,*	Burlingame.	MEIGS, W. O.,†	Anthony.
EDGERLY, S. J.,†	Seneca.	MEIXELL, W.,	Parsons.
EICHOLTZ, E.,†	Detroit.	MEYERS, C. L.,†	Ellsworth.
ESPENLAUB, G. F.,	Rosedale.	MOHLER, M.,†	Osborne City.
FENTON, HARVEY,†	Indianola.	MOSTELLER, G. W.,†	Girard.
FERRIS, H. L.,	Osaage City.	MULLANEY, J. H.,†	Millbrook.
FULTON, F. E.,†	Kinsley.	NESBIT, S. H.,†	Anthony.
GANO, W. G.,*	Parkville, Mo.	NEWMAN, M. B.,*	Wyandotte.
GARDNER, O. O. A.,†	Harbine, Neb.	NEWBY, DAN.,†	Howard.
GAULT, JOS.,†	Great Bend.	NEWTON, DR. W. J.,*	Ottawa.
GIER, WM.,*	Garnett.	NICKERSON, N.,†	Sandago.
GODFREY, A. N.,†	Madison.	NICOLL, JAS.,†	Spearsville.
GOODWIN, DR. W. M.,†	La Crosse.	PEARSALL, U. B.,	Fort Scott.
GOULD, WM.,	Ottawa.	PENNELL, W. M.,†	Russell.
GRAHAM, C. H.,†	Leroy.	PETERS, WM.,†	Columbus.
GRANGER, H. S.,†	Phillipsburg.	PIERCE, F. L.,†	Lakin.
GRIESA, A. H.,	Lawrence.	PIERSON, T. M.,*	Lawrence.
HALL, M.,†	Newton.	PIERSON, J. J.,	Parsons.
HALL, C. C.,	Fort Scott.	PLASKET, WM.,	Baldwin City.
HANAN, B. P.,†	Arlington.	REYNOLDS, SAM.,*	Lawrence.
HARDIN, R. L.,	Topeka.	RICE, E. C.,†	Augusta.
HARKNESS, D. C.,†	Howard.	RHODES, J.,†	Smith Center.
HARRIS, F. B.,†	White City.	ROBERTS, HOWARD,	Ferry.
HART, H. B.,	Fort Scott.	ROBSON, PROF. JOHN W.,†	Cheever.
HATCH, S.,†	Wathena.	ROE, J. R.,*	Salina.
HAYDEN, C. W.,†	Thayer.	SAMPSON, J. G.,†	Derby.
HICKS, —,†	Cambridge.	SCHELL, W. F.,	Fort Scott.
HIXON, J.,†	Holton.	SCHLICHTER, J. B.,†	Sterling.
HOLLINGER, JOHN,†	Russell.	SCOTT, H. C.,	Burlingame.
HOLMAN, E. J.,†	Leavenworth.	SCRANTON, C. R.,*	La Crosse.
HOLMES, C. J.,†	Gaylord.	SEARS, PETER,	DeMorris.
HOLSINGER, FRANK,†	Rosedale.	SHARPE, JAS.,*	Parkerville.
HOGUE, R. J.,†	Winfield.	SHEFFIELD, C. H.,†	Delphos.
HUBBARD, D.,*	Olathe.	SIMMONS, L. A.,†	Wellington.
JACOBUS, J. D.,†	Marion.	SMITH, T. W.,†	Baxter Springs.
JONES, THEO.,	Junction City.	SMITH, W. W.,*	Neosho Falls.
KEELER, A. B.,†	Clay Center.	SMITH, J. B.,†	St. John.
KELSEY, C. C.,†	Humboldt.	SMITH, VAN,†	Hackberry.
KIRBY, P.,†	Burlingame.	SNYDER, EDWIN,†	Oskaloosa.
KNIFFIN, S. W.,	Parsons.	SPIERS, ALEX.,†	Linn.

\* Delegate. † County Vice President.

## GENTLEMEN'S LIST.

SPORE, Z. S.,†	Halstead.	VINCENT, J. C.,	Lawrence.
ST. CLAIR, H. C.,†	Belle Plaine.	VOORHEES, P.,	Lawrence.
STANLEY, J.,	Junction City.	WATT, D. G.,*	Lawrence.
STILES, H. A.,†	Pavillon.	WEAVER, A. J.,†	Sunny Dale.
STONE, J. C.,†	Freeman.	WEIDMAN, J.,†	Pleasant Valley.
STOUT, X. K.,†	Troy.	WELLS, T. C.,†	Manhattan.
STRAYER, S. M.,†	Stockton.	WHEELER, JOSHUA,†	Nortonville.
SWEHLA, F. J.,†	Wilson.	WILHITE, A. G.,†	Emporia.
SWITZER, A. M.,†	Hutchinson.	WILSON, H. A.,†	Great Bend.
TANNER, O. R.,	Barry.	WILLIAMS, J. W.,†	Cope.
TAYLOR, E. A.,†	Beloit.	WILLIAMS, J. L.,†	Oswego.
TRAFTON, N.,†	Milford.	WILLIAMS, O. N.,†	Columbus.
TURNER, CHAS. E.,†	Ottawa.	WILLIAMSON, DR. CHAS.,†	Washington.
VAN DEMAN, H. E.,†	Geneva.	WILLIS, A.,*	Ottawa.

\* Delegate. † County Vice President.

## LIST OF HORTICULTURAL SOCIETIES FOR 1884.

SOCIETY.	SECRETARY.	P. O. ADDRESS.
NORTHWESTERN HORTICULTURAL SOCIETY,	E. A. Taylor,	Beloit.
SOUTHEASTERN	G. W. Ashby,	Chanute.
ANDERSON COUNTY	M. A. Page,	Garnett.
ATCHISON COUNTY	Thos. F. Cooks,	Monrovia.
BROWN COUNTY	Jos. Henney,	Hiawatha.
BURLINGAME	H. Dubois,	Burlingame.
BUTLER COUNTY	Dr. Wm. Snyder,	Towanda.
COWLEY COUNTY	J. Nixon,	Winfield.
CRAWFORD COUNTY	L. J. Colton,	Girard.
DAVIS COUNTY	John Davis,	Junct'n City.
DICKINSON COUNTY	J. W. Robson,	Cheever.
NORTH DICKINSON	M. Bryson,	Cheever.
DONIPHAN COUNTY	S. Hatch,	Wathena.
DOUGLAS COUNTY	B. F. Smith,	Lawrence.
ELK COUNTY	D. C. Harkness,	Howard.
ESKRIDGE	S. F. Tufts,	Eskridge.
FRANKLIN COUNTY	J. Williams,	Ottawa.
HARVEY COUNTY	H. A. Ensign,	Newton.
JACKSON COUNTY	Chas. G. Townsend,	Holton.
JOHNSON COUNTY	E. P. Diehl,	Olathe.
KANSAS CENTRAL	R. H. Day,	Lyons.
LANARK TOWNSHIP	Thos. Murty,	Stockton.
LYON COUNTY	W. H. Mills,	Emporia.
LEAVENWORTH COUNTY	C. W. Keifer,	Leavenw'th.
LABETTE COUNTY	John F. Hill,	Oswego.
MANHATTAN	J. D. Waters,	Manhattan.
MIAMI COUNTY	E. W. Robinson,	Paola.
MONTGOMERY COUNTY	W. T. Yoe,	Independ'ce.
MORRIS COUNTY	F. B. Harris,	White City.
OSBORNE COUNTY	W. G. Short,	Twin Creek.
POTTAWATOMIE COUNTY	Joseph Leach,	Havensville.
PAWNEE COUNTY	C. C. Chevallier,	Garfield.
RENO COUNTY	S. F. Taft,	Hutchinson.
REPUBLIC COUNTY	O. A. A. Gardner,	Belleville.
RICE COUNTY	J. H. Stubbs,	Sterling.
RUSH COUNTY	E. F. Brown,	La Crosse.
SALINE COUNTY	R. H. Bishop,	Salina.
SEDGWICK COUNTY	D. A. Mitchell,	Wichita.
SOUTHERN KANSAS	P. C. Bowen,	Cherryvale.
SOLOMON VALLEY	Van E. Butler,	Delphos.
SOUTHWESTERN	J. H. Pierce,	Garden City.
SUMNER COUNTY	L. A. Simmons,	Wellington.
WABAUNSEE COUNTY	H. A. Stiles,	Pavillon.
WASHINGTON COUNTY	E. J. Nason,	Washington.
WILSON COUNTY	G. B. Brown,	Gullford.
WYANDOTTE COUNTY	M. B. Newman,	Wyandotte.
WYLAND	John Deitrick,	Carbondale.

## CERTIFICATE OF INCORPORATION.

We, the undersigned citizens of Kansas, do hereby associate ourselves as a body corporate, to be known as the KANSAS STATE HORTICULTURAL SOCIETY, for the promotion of horticulture and pomological science in the State of Kansas.

The principal office or place of business of said Society shall be at the city of Lawrence, or such other place in the State of Kansas as the Society may designate at a regular meeting thereof.

The number of Trustees of said Society shall be seven, and such Trustees shall have power to make all necessary rules and by-laws for the government of said Society and the transaction of its business.

Said Society shall have succession, under the provisions of this charter and the laws of the State of Kansas, for the term of nine hundred and ninety-nine years.

In witness of all which, we have hereunto set our hands and seals, at the city of Ottawa, in the county of Franklin, in said State of Kansas, this fifteenth day of December, A. D. 1869.

WM. TANNER, *Leavenworth.*

C. B. LINES, *Wabaunsee.*

WM. M. HOWSLEY, *Leavenworth.*

S. T. KELSEY, *Pomona.*

G. C. BRACKETT, *Lawrence.*

GEO. T. ANTHONY, *Leavenworth.*

J. STAYMAN, *Leavenworth.*

STATE OF KANSAS, }  
COUNTY OF DOUGLAS, } ss.

On this 15th day of December, 1869, before me, a notary public in and for said county, came William Tanner of Leavenworth county, Charles B. Lines of Wabaunsee county, William M. Howsley of Leavenworth county, S. T. Kelsey of Franklin county, George C. Brackett of Douglas county, George T. Anthony of Leavenworth county, J. Stayman of Leavenworth, to me personally known to be the identical persons described in and who signed the above charter, and acknowledged the same to be their own act and deed for the purposes therein.

[SEAL.]

JAMES CHRISTIAN,  
Notary Public, Douglas County.

I, W. H. Smallwood, Secretary of the State of Kansas, do hereby certify that the foregoing is a true and correct copy of the original certificate of incorporation, filed in my office December 20, A. D. 1869.

In testimony whereof, I have hereunto subscribed my name and affixed the great seal of the State. Done at Topeka, this twenty-ninth day of August, A. D. 1871.

{ GREAT SEAL  
OF KANSAS. }

W. H. SMALLWOOD, *Secretary of State.*

## CONSTITUTION.

ARTICLE I. This Association shall be known as the KANSAS STATE HORTICULTURAL SOCIETY.

ART. II. Its object shall be, the advancement of the science and art of horticulture.

ART. III. Its membership shall consist of annual members, paying an annual fee of one dollar; of life members, paying a fee of ten dollars at one time; and of honorary members, who shall be persons only of distinguished merit in horticulture, and shall be elected to membership by a vote of the society.

ART. IV. Its officers shall consist of a President, Vice President, Secretary, and Treasurer, who shall be elected by ballot at each annual meeting of the Society, and shall hold their office for the term of one year, or until their successors shall be elected. They shall perform the duties usually devolving upon such officers, and shall be *ex-officio* members of the Board of Trustees, consisting of the above-named officers and three other members, who shall be elected and hold their term of office as the other officers. Said Board shall, under the direction of the Society, manage all its affairs.

ART. V. It shall hold an annual meeting in the month of December, and a semi-annual meeting in the month of June, at such time and place as the Society or Board of Trustees may direct.

ART. VI. This constitution may be amended at any annual meeting of the Society by a two-thirds vote of the members present.

The following was adopted as an additional article, at the Seventh Annual Meeting, Dec. 2, 1873:

ART. VII. There shall be a Vice President annually appointed from each county in the State, whose duty it shall be to organize local horticultural societies in their respective counties, whenever practicable; to report at each annual meeting on the general subject of fruit-culture in their respective counties; and to look after the general interests of horticulture in their particular localities.

The following article was added to the Constitution during the Sixteenth Annual Meeting, December 5-8, 1882:

ART. VIII.—SECTION 1. *The legislative body of the Society shall consist only of life members, Vice Presidents of each county, and two delegates from each district and county horticultural society which shall have complied with the requirements of Amendment 2 of Article III, adopted at the Ninth Annual Meeting, held December 15, 1875.*

SEC. 2. That all provisions heretofore adopted as amendments to or otherwise affecting the Constitution, conflicting with these amendments and Article VIII, be and the same are hereby repealed.

An additional article to the Constitution, adopted at the annual meeting, December 5-7, 1883:

ART. IX. The Secretary or Treasurer of the Society shall have power to appoint a deputy for their respective offices, who may, under the instructions of the principal and in his name, perform any and all the duties pertaining to said office.

### AMENDMENTS.

No. 1. Article III was amended at the Fifth Annual Meeting, December 19, 1871, by the following resolution:

*Resolved*, That Article III of the Constitution be so amended that all annual memberships shall expire on the morning of the second day of the next annual meeting, and all semi-annual memberships shall expire on the morning of the second day of the next semi-annual meeting.

No. 2. Amendment to Article III, adopted at the Ninth Annual Meeting, December 15, 1875, so as to read:

Ladies attending the meetings of the Society may become members without fee; and two delegates from each of the district horticultural societies, and one delegate from other auxiliary horticultural societies organized under the general statutes of the State of Kansas, attending the meetings of the Society, shall be entitled to a membership without payment of the usual fee.

No. 3. Amendment to Article III, adopted at the Tenth Annual Meeting, December 5, 1876, so as to read:

SEC. 1. Of life members paying a fee of ten dollars in four annual installments of two dollars and a half each.

SEC. 2. That the office of secretary of any district, county and local horticultural society may be made a perpetual membership, upon the terms provided for a life-membership.

No. 4. At the Thirteenth Annual Meeting, December 16, 1879, Article III was amended as follows:

That any person who shall have performed the duties of a County Vice President under the provisions of Article VII of the Constitution for one year, shall be enrolled an annual member; and that when such services shall have been rendered for the term of ten years, consecutive or otherwise, such person shall be enrolled as a life member, and entitled to all the benefits of such membership.

Amendments adopted at the Sixteenth Annual Meeting, held December 5-8, 1882:

No. 5. Article III be so amended as to read: "Any of the aforesaid memberships may be, *for cause*, conferred by a vote of the Board at any of its called meetings, subject to confirmation by the Society at the following annual meeting."

Article IV be so amended as to read as follows: "Its officers shall consist of a President, Vice President, Secretary, and Treasurer, *who shall be elected by ballot at the annual meetings, and hold their term of office for two years, dating from the first day of July next following the annual meeting at which they were elected.* They shall perform the duties usually devolving upon such officers, and shall be *ex-officio* members of the Board of Trustees, consisting of the above-named officers and three other members, who shall be elected by ballot at an annual meeting, and hold a term of office for three years from the date of election thereafter. *The present Trustees shall hold their term of office as follows: The first Trustee for a term of one year, the second for a term of two years, and the third for a term of three years, from the date of election; and hereafter, at each annual meeting, there shall be elected one member of said Board of Trustees, to fill the office of the outgoing member. All the officers shall hold their respective offices until a successor is elected.*"

No. 6. Amendment to Article IV, adopted at the Seventeenth Annual Meeting, December 5-7, 1883, granting certain additional power to the Board:

The Board of Trustees shall have power to fill any vacancy occurring in the offices provided for in Article IV of the Constitution, between the annual meetings of the Society; and any officer so appointed shall hold his respective office until the next succeeding annual meeting, or until a successor shall be elected by the Society.

## STATE LAW PROVIDING FOR PROTECTION OF GAME.

AN ACT for protection of birds, and to prohibit hunting upon certain lands without consent of owner; providing at what season game may be shot, and prescribing punishments for the violation of this act, and to repeal chapter 110 of Laws of 1881.

*Be it enacted by the Legislature of the State of Kansas:*

SECTION 1. It shall be unlawful for any person or persons, at any time excepting as hereinafter provided, to catch, kill, trap, shoot, or ensnare, or to pursue with such intent, any wild bird except the wild goose, duck, hawk; excepting the barrier, crow, blue-jay, snipe, curlew, plover, piper, bittern, heron, crane, and woodpecker.

SEC. 2. It shall be unlawful for any person to shoot or take possession of any pin-nated grouse or prairie chicken between the first day of September and the first day of January, and quail between the first day of November and the first day of January, in each year: *Provided, however,* It shall be unlawful to catch, trap or ensnare said birds at any time.

SEC. 3. It shall be unlawful for any person or persons at any time to hunt or pursue after any wild bird or game upon the occupied or improved premises of another, without first having obtained permission or consent of the owner or occupant of such occupied or improved premises.

SEC. 4. It shall be unlawful for any person, company, or corporation, to buy, or sell, or have in possession, any birds not excepted in section 1, or the birds enumerated in section 2 when the shooting thereof is prohibited, excepting the first ten days after the period when the shooting of the same is prohibited. And the having in possession by any person, company, or corporation, of any such birds, when the shooting thereof is prohibited, excepting the ten days above excepted, shall be deemed *prima facie* evidence of the violation of the act.

SEC. 5. Any person found guilty of violation of any of the provisions of this act shall be deemed guilty of a misdemeanor, and upon conviction thereof before a justice of the peace shall be fined in a sum not less than five nor more than twenty-five dollars for each and every offense, and costs, together with attorney's fee of ten dollars, and shall be committed until paid.

SEC. 6. In all prosecutions under this act, the justice before whom the same is brought may appoint some attorney at law for the purpose of managing the prosecution of the cause, and such attorney shall be entitled to a fee of ten dollars in each and every case where conviction is had in which he is appointed, which shall be taxed as costs in the case against defendant: *Provided,* The county shall in no case be held for said attorney's fees.

SEC. 7. That it shall not be necessary to prove on the trial, or to state in the complaint, the true name of the bird caught, killed, shot, trapped, netted, or ensnared, in violation of this act.

SEC. 8. The provisions of this act shall not apply to any person who shall kill or catch any wild bird or birds for the sole purpose of preserving them as specimens for scientific purposes: *Provided,* That in a prosecution for a violation of any of the provisions of this act, it shall not be necessary for the prosecution to prove that the killing or catching of any wild bird was not done for scientific purpose.

SEC. 9. That chapter one hundred and ten of the session laws of 1881 is hereby repealed.

SEC. 10. This act shall take effect from and after its publication in the Topeka *Weekly Commonwealth*.

Approved March 7, 1883.

PROCEEDINGS  
OF THE  
FOURTEENTH SEMI-ANNUAL MEETING,  
HELD AT  
JUNCTION CITY, DAVIS CO., KAS.,

WEDNESDAY, THURSDAY, AND FRIDAY, JUNE 4TH, 5TH, AND 6TH, 1884.

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[NOTE.—The Society will not be held responsible for individual opinions which are found in this report.—SECRETARY.]

The Society assembled in the court house, at 10 o'clock A. M. on Wednesday, June 4th, and came to order with Vice President M. B. Newman in the chair.

The exercises were opened with prayer, by Rev. M. D. Tenney, of Junction City.

On motion, the President announced the following committees:

*On Programme*—Samuel Reynolds, of Lawrence; H. E. Van Deman, of Geneva; and Prof. John W. Robson, of Cheever.

*On Credentials*—Col. John Davis, of Junction City; J. G. Clark, of Waveland; and H. E. Van Deman.

The Committee on Programme reported for immediate consideration, the present condition of the horticultural interest, and the prospective fruit crop, in the several counties represented by delegations at the meeting.

PROSPECTIVE FRUIT CROP.

ALLEN COUNTY.

H. E. VAN DEMAN, Geneva: Apples promise a good crop; Winesap and Ben Davis are inclined to drop the most; Summer Rose and Carolina Red June are holding on; Rawle's Genet did not bloom full, but the fruit set well. Peaches will be very scarce; pear crop good. Cherry: The Early Richmond and English Morello will be a full, while the common Black Morello will be only a fair crop. The last variety was injured by a cold rain during its blooming. Plum and apricot set a good crop, but are thinning out from curculio attacks. Most of the varieties of grapes are very promising. Blackberries will be a moderate crop; the Kittatinny and Lawton were seriously injured by cold of the past winter; Snyder was badly barked by rabbits, otherwise are all right. Raspberries: Blackcaps and the Turner promise a fair crop. Gooseberry and Juneberry plants are loaded with fruit—the last never fails. Strawberry crop promising. Currants grown in shade are doing well, and with proper care will in the near future become a success. They should be protected from winds. Insects: Canker worm and codling moth (apple worm) are increasing. Remedy for the first species: wrap bodies of trees with strips of "slick" alpaca coated with thick molasses; shake the trees to cause



the worms to drop on their web, then break the web with a pole, or burn them with a kerosene torch, and the worms falling to the ground will crawl to the body of the tree and there accumulate in masses, and can be destroyed easily by sprinkling them with kerosene and firing it. An orchard near me was cleaned of this insect by the foregoing method.

REV. CHAS. REYNOLDS, Junction City: Can anyone tell me of the success of white currants?

H. E. VAN DEMAN: The White Grape currant bushes on my farm are loaded with fruit.

#### CHASE COUNTY.

J. W. BYRAM, Cedar Point: Our orchards were full in 1883. This year they will not yield to exceed 33 per cent. of a full crop. The Rome Beauty is the most productive variety; is carrying its fruit largely on the north side of tree. Missouri Pippin and Rawle's Genet fail this season; Ben Davis trees are carrying a good crop. Peaches failed. Apricot trees are full of fine fruit, which makes three consecutive years of successful fruitage. Pears will be about one-half of a crop—were a heavy yield in 1883. No blight has occurred. The Bartlett leads. Plums full. Cherries very full—the Early Richmond excels all other varieties; common Morello nearly a failure; Downer's Late a fair crop. Vineyards generally are carrying a good crop. Gooseberries have mildewed on bottom lands, but escape it on the high lands. Currants grown in shade are loaded with fruit; red varieties are most fruitful. Strawberries are a good yield. Crescent and Capt. Jack lead; Sharpless succeeds fairly well. Blackberries: The Kittatinny, standing side by side with the Snyder, on bottom land, which was protected on the north, escaped injury during the past winter, while the Snyder was damaged. Insects injurious to the interests of horticulture are not prevalent in the county.

#### COWLEY COUNTY.

G. W. ROBERTSON, Winfield: The apple crop will be good in my county. Peach light; budded varieties, as the Crawford and Heath Cling, are killed. Plum trees are loaded; apricot very full. Cherry and small fruits—blackberry, raspberry, and strawberry—are promising a good crop.

#### DAVIS COUNTY.

WM. CUTTER, Junction City: The apple crop will not exceed two-thirds of an average yield. Cherry, pear and plum full. Peach a failure. Strawberry, blackberry, currant, gooseberry and quince will be a good crop. Peach trees were largely attacked with what is known as "curled leaf."

#### DOUGLAS COUNTY.

SAMUEL REYNOLDS, Lawrence: The prospects for a heavy apple crop were very flattering in early spring, but a cold rainy spell of weather later in the season reduced the crop to about two-thirds of an average annual yield. Winesap and Missouri Pippin trees are more heavily loaded with fruit than in the previous year. Pear trees which are healthy are carrying a fair crop. Peaches are a failure this season. Vineyards are promising. Gooseberries will be a heavy crop. Cherry: Early Richmond and English Morello trees are full enough; common Morello light. Strawberry, full; raspberry, fair; blackberry, a full crop.

#### DICKINSON COUNTY.

PROF. JOHN W. ROBSON, Cheever: The apple crop will be about one-third of an average yield. Winesap, Ben Davis and Rawle's Genet will be light; Maiden's Blush and Jonathan trees are full; the last is inclined to "windfall." The Ribston Pippin is a promising variety with me. Peaches are a failure this year. Apricots, scarce. Pears, a fair crop; Duchesse de Angouleme and Seckel trees are full; Flemish Beauty, light; no blight has appeared. Plums: The Miner prematurely drops. Cherries: Early Rich-

mond, English Morello and Plumstone Morello trees are heavily laden. Vineyards promise a good crop of fruit. Cannot discover any difference in the hardiness of the Kittatinny and Snyder blackberry plants. Of strawberries, the old Wilson's Albany is the best variety that I have grown.

On motion, the Society adjourned to 2 o'clock P. M.

## AFTERNOON SESSION.

WEDNESDAY, June 4, 1884.

President Gale in the chair.

On motion, the subject of county reports was taken up.

### COUNTY REPORTS—*Continued.*

#### ELLIS COUNTY.

M. ALLEN, Hays City: I have some fifteen or twenty varieties of apple trees which are now fruiting. The first cherries produced in my county were in 1880, and we have enjoyed a product each year since. In 1883 sold eight bushels, and from present indications will be able to supply our market with three or four times as many this year. Cultivated plums are doing very well; wild varieties succeed occasionally; are liable to be cut off by a late spring frost and attacks of curculio. Peaches are quite scattering on trees, but I have seen a few even this, one of the most unfavorable years.

#### SHAWNEE COUNTY.

J. G. CLARK, Waveland: The apple crop will be 75 per cent. of an average yield; the Dominie is full, and leads in quantity. Quinces and grapes will be a full crop.

#### RENO COUNTY.

W. E. FOSNOT, Hutchinson: There is a full crop of fruit in my county this year. Apricots and quinces are just beginning to fruit. No diseases have developed, excepting mildew, on the gooseberry.

R. L. HARDIN, Sheridan: The settlers in Rawlins, Graham, Thomas and Decatur counties are planting fruit trees, and every indication is favorable to the success of fruit culture.

#### REPUBLIC COUNTY.

O. A. A. GARDNER, Belleville: Most of our orchard trees are young and just beginning to bear fruit. Small fruits are quite successful. The currant now promises to be successful in the future, as the planters are annually learning what is needed to sustain its vigor and produce fruitfulness.

#### WABAUNSEE COUNTY.

ABNER ALLEN, Wabaunsee: The apple crop will be quite light, owing partly to the damage of a hail storm. Currants would have been a good crop but for the same cause.

#### WYANDOTTE COUNTY.

M. B. NEWMAN, Wyandotte: About the same conditions prevail in my county as have been reported for other counties lying contiguous. The Winesap apples are prematurely dropping more than any other variety.

#### WILSON COUNTY.

W. F. SCHELL: There will be about one-half of a full crop of apples in the county. The Ben Davis and Winesap trees are carrying the heaviest fruitage. Peaches failed. Plums—the Weaver, full. Early Richmond cherry, fair. Apricots succeed, and are

being planted largely. The strawberry crop will be heavy; Crescent leads; Capt. Jack and Chas. Downing are quite a success. Of currants, the Cherry is the most promising. The Juneberry is very productive.

DR. CHARLES REYNOLDS, Junction City: I am surprised that anyone should report a failure of the Missouri Pippin. I had supposed that the variety was a constant, unfailing bearer.

J. W. BYRAM: The Missouri Pippin as well as the Rawle's Genet failed because of the exhaustion of a very heavy crop of fruit in 1883.

J. D. WALTERS, Wakefield: In my locality the apple crop will be light with most of varieties; the Winesap trees are well loaded. Cherry crop, good. Blackberry, half a yield of favorable seasons; Snyder blackberry plants are no hardier than the Kittatinny.

County reports were closed, and the President announced the reading of the following essay:

#### SMALL FRUITS.

BY B. F. SMITH, LAWRENCE.

So many papers have been written on strawberry culture, and varieties suited to our climate, at previous meetings, that I will not worry the patience of the Society with a lengthy paper.

I am now harvesting this season's crop, and the prospect for a good yield is so flattering that I cannot resist the temptation of making the following statements. The season has been just what this berry requires to develop a fine product—plenty of rains, and that medium temperature between heat and cold which best suits this berry.

First in my experimental beds is a block of Jersey Queen. I say *block*, as I plant in blocks or squares, leaving a four-or-five-foot road between the different kinds, to prevent varieties from mixing, through their runners. The Jersey Queen does not meet my expectations in productiveness, for a commercial grower; but the berry is good, and very large.

The second block is planted to James Vick, which is a late-ripening variety—about the same time as Glendale. Produces an astonishing amount of well-formed, medium-sized berries.

The third block is of the Old Ironclad; plants wonderfully vigorous, but a moderate bearer of rich scarlet berries. It is not as prolific as represented by Mr. A. M. Purdy, of New York, but about equal to the Charles Downing; no rust on its leaves. The Miner's Great Prolific, now being gathered, ripens with the Crescent, and ranks next to that variety in productiveness; it is an attractive berry, of good flavor.

The Bidwell, for flavor, leads all other varieties on my grounds, when fully ripened, but is not satisfactorily productive. It may yield better if confined to stools.

A block of Arnold's Pride, a variety originating in Canada, and ripening later than either the James Vick or Glendale, is bearing a full crop of large berries.

The Finch is a remarkably vigorous grower, and fairly prolific; is one of the medium-season varieties.

The Piper does not sustain the merits claimed for it by our Northern Illinois friends—that it is more productive than the Wilson's Albany.

Sharpless is well set with berries, and giving better satisfaction than heretofore.

I am disappointed in the Seneca Queen, except its flavor, which can hardly be excelled; such is the commonly-expressed opinion of those who taste it.

The Glendale and Windsor Chief are still in bloom, and the vines present a pleasing prospect for a good crop ten days hence.

Capt. Jack is carrying a good crop, which is later in ripening than usual.

Wilson's Albany is affording better success than during the past five years. It is the "boss" shipper, and on this account cannot well be spared from a recommended list for planters.

The Chas. Downing is liable to leaf-rust in some localities, but has not suffered as much from the disease as formerly.

The Crescent still leads in a large yield of fruit.

#### DISCUSSION ON SMALL FRUITS.

##### STRAWBERRIES.

ABNER ALLEN, Wabaunsee: The Bidwell and Wilson's Albany, as well as all other varieties, are productive in my locality.

PROF. J. W. ROBSON, Cheever: The Bidwell strawberry succeeds with me. I have a bed of Wilson's Albany, planted in 1878, which has received no other care than a mowing-down twice each season, and here is a box of the fruit raised under such treatment. [They were fine specimens.—SEC'Y.] Any farmer can have a supply of this fine fruit, if he will only give the plants moderate attention. The Wilson's Albany, when fully ripe, is not very acid.

J. W. BYRAM, Cedar Point: The Wilson's Albany is a shy bearer with me.

J. G. CLARK, Waveland: Berries are more healthful when eaten without sugar.

J. M. SHEPPERD, Abilene: I fully concur with Mr. Clark. Berries are sweet enough when well grown and thoroughly ripened.

M. B. NEWMAN, Wyandotte: Many persons pick berries before they are ripe. The Wilson's Albany strawberry is a high-colored variety, and should remain on the plant until quite dark—then its flavor is not so acid or objectionable.

DR. CHAS. REYNOLDS, Junction City: I should be glad to hear from our Secretary on the subject of small fruits, as one having had extensive experience with their culture.

SECRETARY: I have not the time now to discuss this subject. My duties of keeping the records of your proceedings prevent.

DR. REYNOLDS: I move that our Secretary be requested to prepare a paper for publication with these proceedings on the subject.

Motion prevailed. [The paper will be found following the report of Committee on Small Fruits, in the Appendix.—SECRETARY.]

J. W. BYRAM: I used to believe that there was no better variety of strawberry than the Wilson's Albany, but twenty years' experience and observation have changed my opinion, as I learn of other varieties and the influence of varying locations.

##### CURRENTS.

PROF. J. W. ROBSON, Cheever: In 1870 I planted four hundred currant bushes, and in about four months they were all dead. I have since discouraged the planting of this fruit. I will now take back all I have said against it, as I find proofs of success in my own county.

N. M. CHANDLER, Ottawa: I have grown currants successfully in the shade of Juneberry plants.

J. M. SHEPPERD, Abilene: They succeed with me.

W. E. FOSNOT, Hutchinson: I have here a fine exhibit of currants on the bush, which were grown on the north side of a building in Reno county.

O. A. A. GARDNER, Belleville: I have succeeded in growing this berry by only heavily mulching the plant.

COL. JOHN DAVIS, Junction City: This berry does not require shade. Plant on a soil partially exhausted by cropping, and then mulch, and you will succeed.

H. E. VAN DEMAN, Geneva: A moist, cool soil is the home of the roots of the currant bush, and when planted in such localities they will succeed.

## BLACKBERRIES.

L. A. SIMMONS, Wellington: The Snyder has never winter-killed with me, while the Kittatinny has.

H. E. VAN DEMAN: I have had the Snyder under culture for the past ten years, and it has not been winter-killed during that time.

## RASPBERRIES.

L. A. SIMMONS: The Ohio Beauty is the hardest variety of blackcaps I have.

H. E. VAN DEMAN, Geneva: The red variety known as the Turner is a safe variety to plant in my section of the State.

## GRAPES.

J. G. CLARK, Waveland: I have propagated the Delaware vine, and grown it in the vineyard just as easily as any other variety. It needs a dry, rich soil, and well under-drained.

H. E. VAN DEMAN, Geneva: I have seen the new variety, Prentiss, and the Delaware, this year successfully fruiting. I believe these varieties do best when propagated by layering, and that such plants are more productive than when grown from cuttings.

Discussion closed, and the following essay was read:

## ANALOGIES IN ANIMAL AND VEGETABLE PHYSIOLOGY.

To fully understand all the features of horticultural science, it seems to me necessary to include a careful study of animal physiology. And while I am aware that there are some very successful horticulturists who claim that there are no analogies between vegetable and animal physiology, I must persist in entertaining affirmative views on this question; and by presenting such herein, I hope to draw out such discussion as may lead to correct conclusions, whether *pro* or *con*. For whatever is true it is profitable that we should understand as truth—while false notions should be demonstrated as such, and hence abandoned.

The first analogy to which I propose to call attention is that found in the modes of multiplication in each kingdom. Away down among the lowest orders of each, from the single-celled protozoan up to the mollusks of the one kingdom, and of the corresponding orders of the vegetable kingdom from the aërogens downward, the modes of multiplication are almost uniformly by subdivision, in the various forms of fission and germination. By the former mode the parent among the lower orders, whether animal or vegetable, divides itself at maturity into two or even scores of parts, each of which parts is readily developed into a new individual. And by the germinative mode, among the more highly organized of these lower orders in both kingdoms, multiplication alike occurs—that is, protuberances grow out of the surfaces of the animal parent, and buds or fronds are thrown out from the vegetable parent; and in both cases these are alike severed from the parent body by self-action or other forces, and at once become new individuals of the respective species. So far as my research extends, these parallel modes of multiplication are recognized by the most authoritative naturalists of our times. But the analogies in the modes of multiplication do not cease with the lower orders in the respective kingdoms. In the higher animal orders, from the lowest to the highest vertebrates, and in the corresponding vegetable orders, from the lowest flowering plants upward, sexual relations become the ordinary and almost universal modes of multiplication in the respective kingdoms—the exceptions being found only in occasional transitional modes from the asexual to the sexual, and which are alike to be found in both classes.

But another interesting analogy is to be found in the effects of differing methods of culture and training in each class of cases. With proper care and nutrition, how steady is the growth and how symmetrical is the development of both plant and animal; but

under neglect and defective nutrition, how meager and shabby is the development of either. Again, children reared in the lap of luxury, without lessons of self-reliance being taught them; or animals reared in stalls, without opportunities for healthful and invigorating exercise; or birds reared in cages; or trees or plants supported by attachments to stakes, trellises, and walls—how alike are all these, when deprived of their accustomed artificial supports, in their inability to provide for their own support in the general struggle with the ordinary vicissitudes of nature. And further, as the muscles of the laborer increase in firmness with his healthful occupations in the open air, so also do the fibers of the tree develop in strength as they are swayed to and fro by the winds to which they are regularly exposed. And each is similarly hardened and strengthened most at the points of greatest tension and pressure. But this analogy may be further exemplified through the processes of obtaining new and improved varieties in the various species of the respective genera of each kingdom, by domestication and cultivation. For it is by stimulating culture that we develop new and improved points in each; and by crop-breeding and crop-fertilization respectively that we obtain union in individuals, of the desirable points achieved; and afterwards, by proper attention to the modes of propagation in each class, we perpetuate the improvements thus obtained. And alike in our fields, orchards and gardens we daily witness the valuable results of these analogous operations.

Next, I may briefly call attention to the very familiar analogies manifested in the cellulated structure and development, as shown throughout all classes, orders, genera and species of each of the great natural kingdoms. And herein it becomes only necessary to point to these conspicuous resemblances, in both animal and vegetable organisms; and to refer to the most generally accepted doctrine of the accretion and development of new cells in each, through the vitalizing influences of those primarily formed or existing. The analogies herein are so well marked, and so fully recognized, that argument as to their existence becomes actually unnecessary.

But another analogy, and really the most interesting of all, may be discovered in the conditions of health and disease, and adaptation to location or environment. Whether in the tropical, the temperate, or the arctic regions, each species of each kingdom finds its suitable habitat in the locality most conducive to the necessities of its nature. And either of these species being transferred to a different environment, is apt to descend to a lower scale of vitality and fecundity; at least until by the equilibrating forces of nature adaptation to the new environment is brought about. And this parallel may be further and most profitably extended by reference to the respective susceptibilities to the influence of epidemic and contagious diseases, and to the conditions for resisting the same. While individual men, and individuals of other species of the animal creation, pass unharmed in the midst of baleful prevailing diseases, a corresponding immunity may be observed among favored individuals of the various vegetable species, while disease and death are prevailing in wide-spread localities around them.

Now, without pursuing further the actually almost-innumerable analogies discernible in the varied features of vegetal and animal development, it may be profitable to glance at some of the horticultural lessons to be learned therefrom. Thus, in the parallel last referred to, the question arises: Why is it, that, with equal exposure to the prevailing cause of any particular disease, individual persons, and individuals of other species of animals, as well as individual plants and trees, and even particular branches of trees, are liable to be attacked by like insidious causes, while others escape entirely unaffected thereby? Is it not a well-established axiom that "like causes produce like effects, other circumstances being equal"? Then, if this axiom be reliable, why are not *all* individuals of any animal species, or all plants, trees and branches of any species of the vegetal kingdom, alike affected by particular prevailing diseases? Whether the cause be external

or internal, should not its prevalence act upon all alike? What, then, are the varying conditions or circumstances that afford immunity to certain portions, and at the same time give susceptibility to disease to others? Does not the careful consideration of these questions necessarily lead to the conclusion that special conditions of susceptibility in the one case, or the absence of such in the other, is the true solution of such yielding to or resistance of such prevailing cause of disease? If so, then our energies should be specially directed, in our horticultural studies, to tracing out and critically exposing the varying conditions which are regularly attended with such varying results.

But do the analogies, if such exist, in animal and vegetable physiology, afford us any aid in this course of investigation? I would emphatically answer this question affirmatively. And in support of this position I consider it only necessary to pursue the parallels between the disorders of the human family, the highest of the animal kingdom, and those of our orchard fruits, which one of this Society claim to be the head of the vegetable kingdom. What then is the general doctrine to which all of our best medical authorities subscribe, as to the means of escaping the attacks of pestilential and epidemic diseases? With almost entire unanimity they advise careful attention to the laws of health, as regulated by food, digestion, nutritive assimilation, and cleanliness, combined with the aids of prophylactics and disinfectants. The best physiological conditions being thus secured, immunity from disease is hopefully relied upon. Hence, if the analogies referred to really exist, we, as horticulturists, (or "herb-doctors," if you please,) must give strict and watchful attention to the general conditions of health in our orchard trees, vines, etc., and by careful and intelligent experiments ascertain the treatment, both internal and external, best suited to warding off the attacks of prevalent diseases and insect enemies among the objects of our care. And as it is generally understood among intelligent horticulturists, that the borers and other insect enemies get in their most destructive work on trees, etc., of feeblest vitality, we may yet hope to ascertain some means of giving such healthfulness and vigor of growth to our developing plants and trees as will overcome, or at least largely counteract by sap-drowning and otherwise, the evils too commonly occurring from their various disorders and insect enemies. And I must be permitted to add that a closer observation of the laws of our own being may yet prove to be one of our best guides in promoting the health and productiveness of our orchards, vineyards, and gardens.

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WEDNESDAY, June 4, 1884.

President Gale in the chair.

The exercises opened with essays on the following subjects:

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BY MRS. M. A. HUMPHREY, JUNCTION CITY.

Every year the order goes forth and is heralded through our State, "Plant trees," "Plant trees," and how enthusiastically the command has been received, and how effectively put in force, let the fair young groves and blooming orchards which now adorn our once treeless plains make answer.

And so cheerfully has Mother Nature responded to the touch of the wand of labor, that our earliest planters now sit in the shade of their own vines and trees, and their children sport beneath the wide-spreading branches thereof. To the former the lone barren prairie is a memory, to the latter a myth. Twenty miles a year, it is said, we are gaining upon and wiping out the Great American Desert.

From our own experience and from that of other countries, we are led to infer that there is no desert so void and naked that it might not be reclaimed in the course of half a century. The Khedive of Egypt has wrested land from the sand wastes as the Hollanders win it from the sea, and by a cheaper process than by the building of extensive dikes—simply by planting date palms and olive trees. In France the government has reclaimed the Landes, a sandy steppe on the southwestern coast, by planting willows and bay trees; and even Algeria has been improved by the persistent tree culture of the French colonists.

Happy is the generation which is able to profit by the mistakes of those gone before.

Humboldt once said, while contemplating the evils wrought by the wholesale destruction of forests: "Truly, men in all climates seem to bring upon future generations two calamities at once—a want of fuel and a scarcity of water." Champollion is reported as saying in reference to the great desert of North Africa:

"And so the astonishing truth dawns upon us that this desert may once have been a region of groves and fountains and the abode of happy millions. Is there any crime against nature which draws down a more terrible curse than that of stripping Mother Earth of her sylvan covering? The hand of man has produced this desert, and, I verily believe, every other desert upon the surface of this earth. Earth was an Eden once, and our misery is the punishment of our sins against the world of plants. The burning sun of the desert is the angel with flaming sword who stands between us and Paradise."

Plants are the children of the earth, since they receive their nourishment directly from her bosom, while the more highly organized animals live upon plants or upon animals which have first been nourished by plants.

We are not concerned at present, however, with the relative values of the various food plants, nor even with the medicinal remedies plants provide us with, but wish rather to give attention for a few moments to their influence within doors and without, in conducing to health and preventing disease.

That vegetation purifies the air, chiefly by three functions—i. e., by absorbing carbonic acid, by exhaling oxygen, and by producing ozone—has been placed beyond doubt by vegetable physiologists, and chemists. And though it has also been maintained that the absorption of carbonic acid, and the production of oxygen and ozone, by house plants, is so small in quantity as to produce no appreciable change in the composition of the atmosphere of the dwelling, yet so potent are these effective agents that the most infinitesimal portions may often be the means of turning the scale in favor of a healthy condition. According to Schönbein, air containing but 1–3,240,000 of ozone, is capable of disinfecting its own volume of air filled with the effluvia evolved in one minute from four ounces of highly-putrid flesh.

And though the sun, acting upon flowers and plants, as well as the leaves of trees, is constantly distilling this poison-destroying element, very little finds its way into our dwellings, the most of it being consumed in oxidizing outside impurities.

But conceding that the chemical effects of a rose, a geranium or a begonia are so infinitesimal as to be incalculable, they possess, nevertheless, a hygienic influence of great value in the impression they produce on our minds and senses. Medical men tell us much of the influence of a certain relative proportion of pleasurable and painful impressions upon health. The painful sensations, which must needs come to all in daily life, must be counterbalanced by some kind of pleasure or other.

Are the daily tasks monotonous and wearisome? Do they cramp the soul and weary the body? Let the eye rest for a moment upon the brightly-blooming house plant, and a thrill of pleasure is experienced, calm and pure, because free from all taint of passion, and felt all the more intensely, because nameless and indefinite; and this simple pleasure may in many cases give the preponderance to the pleasurable, and furnish the stimulus necessary to enjoyment and consequently health. Flowers in a room, like condiments in the food, have a direct sanitary value.



The same may be said of private gardens and public parks, and justifies the expense incurred in the artistic perfection of them, as the more tastefully laid out and the more carefully tended, the better the effect.

Modern hygienic investigation has demonstrated the fact that a condition of health is largely dependent upon the variations of moisture in the soil; that a country denuded of its trees is subject to these variations, and that one-fifth of the area might advantageously be given up to the cultivation of forests.

Plantations in India are found to be preventives of that great scourge, cholera. Roads which lead through forests, though traveled daily by hundreds who might carry contagion, are found to be nearly free, while the barren, treeless plains are covered with the dead and dying.

European soldiers in India when quartered in barracks surrounded by trees, have been observed to have comparative immunity.

In Bavaria during the cholera epidemic of 1854, places situated in the forests were spared, notwithstanding the otherwise bad condition of the inhabitants.

The same thing has also been observed in Saxony, and even if deductions must be made cautiously we are convinced that these facts tell undisputably in favor of trees and woods.

Vegetation also purifies the soil from the refuse matter of human habitations, the roots of the trees taking up much deleterious matter. But it will not do to tax them in this way too heavily.

Forests are also a protection from vicissitudes of temperature. They intercept the winds, moderating equally the chill breezes of the north and the blighting heat of the south. They capture the rays of the sun and store them up for fuel in winter while yielding us coolness and shade in summer.

As a condition of health, our internal organs must be maintained at a uniform temperature of 98°, whether the surrounding atmosphere is that of tropical heat or arctic cold. Deviations of but one degree are signs of serious illness. We are provided, of course, with a self-regulating apparatus which performs this colossal task, under ordinary circumstances, by means of an increase or diminution of the peripheric circulation and the pores of the skin. But under pressure of extremes we are obliged to resort to artificial means. Against cold we have excellent methods in clothing, dwelling, and fires. Against heat we have as yet less effective means in baths, cooling drinks, fans, and shade—the most grateful form of the latter being furnished us by the trees which line our sidewalks, surround our dwellings, or woo us to rest beneath their branches in the wood.

Besides the more obvious effect of preventing the sun's rays from striking us directly, a great deal of heat is neutralized by evaporation from the leaves, another portion from the decomposition of carbonic acid. Prof. Ebermayer, who has made a study of forestry, tells us that the temperature of trees in a forest is always lower than that of the surrounding atmosphere; a portion of the heat of our bodies is therefore lost by radiation to these cooler objects.

Besides this, shade in the open air always produces a draft which acts as a kind of fan. The air being slightly cooler in the shade, layers are formed, differing in gravity, which cause motion. In the wood, the air from outside is drawn in, cooled, and returned to us again. The evaporation of moisture stored up by the leaf-covered soil, as well as that which has been carried deeper by the roots, also moderates the temperature of the surrounding atmosphere. Ebermayer estimates the presence of a forest to be equivalent to a change of several degrees of latitude.

Therefore plant trees: they measure their ages not by months and seasons, but by

centuries. They have important relations to agriculture, to commerce, to the industrial arts, and are essential to the health and welfare of mankind.

This was followed with a lecture by Professor Hay, of Junction City, on "Geology of Central Kansas."

On motion, the thanks of the Society were tendered to Mrs. Humphrey and Professor Hay for their valuable contributions to the exercises of the meeting.

Adjourned to 9 o'clock A. M., following day.

## FORENOON SESSION.

THURSDAY, June 5, 1884.

President Gale in the chair.

Exercises opened with prayer, after which the following paper was read:

### RANDOM THOUGHTS ABOUT TREES AND FRUITS.

BY J. G. CLARK, OF WAVELAND.

If we are to plant an orchard, the first thing to do is to decide what varieties to plant. If for family use, plant the kinds that you prefer for your use; if for market, you should consider the market you have to sell in, and the wants and taste of the buyer and consumer. It is safe to decide that if we plant an orchard at the present time (1884), by the time it comes into bearing the coarser varieties of apples will not be salable in our markets. The present bearing orchards of Kansas contain a large proportion of Ben Davis, Missouri Pippin, Limbertwig, Gilpin, and others of their grade. They have been useful in their time; but they will not sell in our markets ten years from to-day for what they cost.

We should in no case plant any more than we have the ability and disposition to take care of until grown to perfect trees with all the forces requisite to bear fruit, and then our work is not done. It has been said, and very truly, that "Eternal vigilance is the price of liberty;" and so it is with good fruit. We must watch and be careful to do all that we can for the growth and preservation of our trees. I believe, from my observation, that one-half of all the fruit trees that have been planted in our beautiful State from the first settlement to the present time (1884), have been left to perish among weeds, rabbits, and cattle, with insects to hurry them on to death. This great waste ought not to be repeated, but it has been and will to some extent be. It is to be expected that the horticultural societies that are spreading over the State will correct this evil to a great extent.

It is advisable to plant our orchards on reasonably good land. It need not be our best farming land; but it is of vital importance that the site should have natural drainage sufficient to run the water off the surface soon after it falls. Avoid all table-lands with tenacious subsoil that will hold water in ponds. Prepare the land as for a corn crop; mark it off both ways, and plant carefully and not deeper than the trees stood in the nursery; bank up the trees two or three inches above the level of the ground, and when the rains have settled the ground it will be about right; cultivate as often during the summer as will be necessary to keep weeds out and keep the soil in good condition. With this treatment your trees will make a large growth the first season. It will be advisable to plant corn or potatoes between the rows the first two years. If land is not as rich as it should be, spread barnyard manure over the whole surface of the ground—not pile it around the trees. After the second year, red clover may be sown between the rows, and still cultivate around the trees until they shade the ground on which they stand.

There has been a great deal said and written on the subject of pruning trees. I would say I find the trimming of trees a *necessity*. Trim the young trees to make the tops as near equal on all sides as possible. But trees should not be trimmed for pastime, or to suit a pattern of fancy. We must remember that we do not make the trees. They grow, and have a form of their own. We can prune off the deformity, and let nature do the building. When the tree comes to bearing fruit, we have an opportunity to use our judgment in trimming and thinning out the limbs that the tree may not carry more fruit than it can bring to perfection. It is sometimes necessary to cut away large branches. In such cases the stump should be painted, to prevent the checking of the wood. I do not think it possible for me to give any stated directions for trimming an orchard or a tree, until I have seen the tree. We should in all cases use our best judgment, and in no case be reckless.

The true horticulturist has a love for his trees and plants next to that of parents for their children, and without this love for the occupation, he will hardly succeed.

The following paper was then read:

#### THE CANKER WORM IN SOUTHEASTERN KANSAS.

BY GEO. W. ASHBY, CHANUTE.

The anticipation of injury from the canker worm, at the approach of spring, was not fully realized, although it made its appearance in force about the 12th of April. In some instances measures had been taken to prevent the ascent of the female moth by the usual contrivances of wrapping the trunks of the trees. One method I will here mention, for its cheapness and its effectiveness, as practiced by the Hon. M. T. Jones, in his orchard. In that part of it the most seriously affected the previous year, he wrapped or tied a band of raw cotton around the trees. On these, few or no worms appeared, while in some parts of the orchard not so treated the worm appeared in great numbers. Here, showering the trees with a solution of London purple was practiced, with the effect to entirely destroy the worm; but in some instances, where the work of mixing the solution was intrusted to the work-hands, they made it too strong, and killed the fruit and foliage of the trees. Mr. Jones, however, feels sanguine that in the campaign he has completely rid his orchard of the canker worm. In other instances, no previous guards had been provided; but awaiting the advent of the worm, showering the trees, as before indicated, was practiced, and with the same results in the destruction of the worm as with Mr. Jones. And in still other instances, active measures were anticipated on the appearance of the worm, but from preventing causes, where the work of destroying the worm did not immediately begin, it was discovered that the worm was disappearing about as fast as it came; and without further measures these orchards passed through the ordeal without any perceptible injury.

This last is attributed to two causes: the spring was cold, with frequent rains, northern and eastern winds prevailing, with a heavy snow storm on the 22d of April followed by many days of cold and chilly weather. Finally, about the 1st of May, it culminated in almost a biting frost. These conditions appeared to have been destructive to this worm. And another cause that is now known to be a most important feature in the extermination of the canker worm, is our Kansas birds. Mr. Kanous, of Wilson county, an intelligent and large orchardist, gives the following information: That from the number of canker worms in his orchard in the season of 1883, he anticipated an expensive warfare in the following spring, and had provided all the necessary means of a determined combat; but perceiving, on the first appearance of the canker worm, other enemies than himself, he decided to investigate, and learned, from daily observations, that the large flocks of birds in his orchard were feeding upon the worms, and perceptibly diminishing their numbers. He concluded that they, in conjunction with other causes, would

exterminate them. He further states that his experience is that of his neighbors; and that it is their further observation that the number of our native birds has increased prodigiously in the last few years, and are now regarded by them as their most faithful ally and adjunct in their future horticultural enterprises.

It is but fair to state, in regard to birds in our locality, that we have many people whose metes and boundary lines of possession are the rifle-pits—the outlines of the fortifications of their castles—over which none of the ungodly are permitted to cross, with dogs and shotguns, to molest the birds. I believe, Mr. President, the time is approaching when, instead of it being a misdemeanor in the State of Kansas to wantonly kill a bird, it will be, as it should be, a felony.

On motion, the President appointed the following gentlemen as a committee on fruits exhibited at the meeting: J. W. Byram, Cedar Point; F. Wellhouse, Fairmount; S. B. Kokenour, Manhattan.

The President announced as next in order the following essay:

#### NOTES BY THE WAY.

BY SAMUEL REYNOLDS, LAWRENCE.

The work of this Society will never be fully accomplished as long as vegetables, fruits and flowers can be grown. As long as the present mundane conditions exist; as long as generations come and go; as long as the rising generation comes on the stage of action with undeveloped faculties; as long as the growth and maturity of all the products of the soil are based upon natural laws which require patient, persevering study to understand—in a word, as long as water runs and grass grows there will be abundant work for this Society and kindred ones. The existence of such societies as this becomes necessary, not only for the improvement of horticultural products, but also in maintaining the standard of excellence already attained, and in preventing a retrograde movement in the quality of those products. It seems to me this is a thought worthy of our consideration.

As this Society is a working body, there should be no idle members in it. It therefore becomes the duty of each and every one to contribute whatever he can to interest and benefit the whole. We are not all gifted nor constituted alike. Some are close observers of the workings and operations of nature, and can contribute facts both useful and instructive. Some, of a more practical turn, take pleasure in testing new varieties of fruits and flowers, and noting results from which much useful knowledge becomes public property. I believe there is plenty of work for every member of this Society to do, whatever may be his education, accomplishments, or turn of mind. On this thought the presentation of this paper is based.

Among all our horticultural productions, I consider the apple orchard of paramount importance for health, profit, and the general use of its products. No farm is complete without this adjunct.

By way of practical hints, I shall give you some facts noted in my visits to the principal orchards of Douglas county last summer, in collecting fruit for the two great Kansas fairs.

I found many orchards sadly neglected through lack of culture, pruning, mowing of weeds, etc. This neglect invariably resulted in smaller fruit and less vigorous trees. On the contrary, however, I found many orchards well cared for, in excellent condition, and bearing an abundance of fine fruit.

#### LOCATION.

Orchards located on a side-hill or slope, with low land contiguous, were found to be the most constant bearers. For this fact there are three reasons: First, rows of trees occupying different levels have their roots in different strata, thus preventing their interlocking; while those planted on a level occupy the same stratum, and the roots run together

and interlock. Second, surface drainage, so necessary to the health of an orchard, is natural and perfect. Third, the contiguous low land acts as an air drain, and saves the bloom from the late spring frosts. Anyone can realize this fact by passing from high to low land in a still, frosty morning.

With many, the mode of treating bearing orchards is to seed down with red clover. I deprecate the practice. The clover is a subsoiler, and feeds largely below the cleavage of the plow, in the same stratum with the roots and rootlets of the trees. The gases held in solution in the soil and subsoil have to feed two crops instead of one—a crop of roots and a crop of clover. The roots are therefore robbed of their nourishment to the extent of that absorbed by the clover, which is known to be a great absorbent. Downing says: "The great length of the roots and rootlets of plants is almost incredible. Actual measurement has shown the squash to have roots whose aggregate length reached 80,000 feet, or about fifteen miles. One of the functions of the roots is to fix the plant in the ground, and then feed it. Roots take up a large quantity of water, in which are fertilizing properties held in solution. This water is taken up by the cells and carried to the extremities of the trees. As evaporation takes place from the leaves, the fluid ascends to supply the waste, and hence a circulation of the sap is kept up." There are seven nutritive substances taken up by the roots, which are necessary to plant life. These are carbon, nitrogen, oxygen, hydrogen, iron, sulphur, and potassium. From the above it will be seen that bearing trees should have full and undivided possession of the soil. While clover is an excellent farm crop, for fodder as well as for the reclamation of poor land, it should be sown where it will not rob the orchard.

Doubtless the proper method of treating a bearing orchard is to plow and otherwise stir the soil through the growing season, mowing the weeds closely where the plowing is prevented by the branches. Trees, to be in perfect health and vigor, require the soil to be in condition to absorb the rain and air, which contain the gases upon which they feed. The experience of Mr. Wm. E. Barnes, the largest apple grower in Douglas county, is that plowing and frequent stirring of the soil will to a great extent prevent the premature dropping of the fruit. Where there was most grass and weeds and no tillage, was found the largest quantity of premature fallen fruit.

#### HOG CULTURE.

In some orchards hogs were turned in to root and wallow at will, making excavations in places deep enough to bury a horse, leaving the roots and rootlets exposed to dry up and perish, and leaving the soil as hard as the traveled highway. I condemn hog culture. Man, in this age of improvements, possesses better implements for the cultivation of the soil than a hog's snout furnishes, even though a Missouri rooter. I have in mind now more than one orchard completely ruined by keeping hogs in them. These are historical facts, and we cannot afford to ignore the teachings of history. Remember, Greece had her Alexander, Rome her Cæsar, France her Bonaparte, England her Cromwell, the United States of America her Jeff Davis—and Kansas has her Poland-China! Those countries were shaken from center to circumference by unprincipled ambition, and the Kansas hog has no more principle than any one of the above quartette. Let his ambition have full scope, and he will disrobe your Ben Davis, obliterate the name of Jonathan, put to shame your Maiden's Blush, run out your Smith's Cider, dismantle your McClellan, dethrone the King of Tompkins County, and totally ruin all the other occupants of the orchard.

The comparative health and vigor of trees of different varieties were quite noticeable. The Ben Davis, Missouri Pippin, Maiden's Blush, Jonathan, Dominic, and most of the sweet varieties, were found to be generally healthy and vigorous. The older trees of the Winesap and Grimes's Golden seemed to have diseased roots, and to be giving out. This was shown by the small pale foliage, the overbearing of fruit, and the general

debility of the tree. These are both choice sorts, and if they eventually succumb it will be a serious loss to the orchards of our county. The advice given here is to plant sparingly of these two varieties until further developments. It may be that these trees may prove healthier in other parts of the State.

#### CHERRIES.

Much complaint was made of the failure and premature decay of the Early Richmond cherry tree. The cause, to me, is obvious, and the remedy available. The cherry tree is a great feeder, and in most orchards it is "starved to death." At the last annual meeting of this Society I referred to a cherry orchard in Lawrence, which was the wonder of all beholders, both in its vigor and fruitfulness. There is nothing of superior advantage in location or soil. Its great success can be attributed only to the bountiful feeding of barnyard manure which it gets every year. I am now prepared to give the figures showing the quantity of fruit gathered and amount realized. Two hundred Early Richmond trees were bought of G. C. Brackett and planted in 1872. Distance of trees apart,  $16\frac{1}{2}$  by  $8\frac{1}{2}$  feet, making the area 41,666 $\frac{1}{2}$  square feet, which is 1,613 $\frac{1}{2}$  feet less than an acre. In 1882, 2,829 quarts were gathered; amount realized, \$323.85. In 1883, 4,397 quarts gathered; sum realized, \$481.22. The land is covered with stable manure every year, to the depth of several inches.

There are but few orchards in the county where sufficient space is given the trees. As a rule, 20 and 25 feet were the distances found between the trees, and nearly every owner was deploring the fact. As soon as the trees are large enough to bear any considerable amount of fruit, the branches interlock, making it difficult to drive a team between the rows. It was a sad mistake in the early planting of our orchards, and one not now very easily remedied. Our mutual friend Deming informed our Society some two years ago, that he was determined to remedy the difficulty in his orchard by cutting out one half the trees that year, and the other half the next year. I suppose it must have been a *lapseus lingua*, as the latter part of his promise has never been performed. An apple orchard should never be planted closer than 30 feet; and 33 feet or 2 rods is still better. This latter distance gives 40 trees to the acre, which in my opinion is the correct distance. Not more than a month ago I measured an apple tree of the Fulton Strawberry variety, planted in 1858, and therefore 26 years old. The circumference of the trunk near the crown measured seven feet, the circumference of the outer limbs 120 feet, and the tree is proportionately high. Forty trees of this size would completely shade an acre of land, and preclude the driving of a team between the rows. Orchards are planted more for the future than the present, and we should be very careful not to make mistakes that would destroy or even impair their future usefulness.

I can conceive of no better way for the average man to benefit posterity, and leave the world the better for his having lived in it—in a material and hygienic sense—than by the judicious selection of trees, and the proper planting of the same. As horticulturists we have other duties to perform and responsibilities to meet besides the planting and care of trees. A kind providence has given us a beautiful world to live in, and propitious circumstances have placed us in a portion of it which it is claimed is the best work of God's creation. It has long since passed into a proverb "that for natural beauty and natural bounty God never made a better country than Kansas." In our rural life we have everything around us to contribute to our health, comfort and happiness. The warbling birds, the fragrant flowers, the verdure-clad landscape, the purling brook, the balmy breeze, the refreshing shower, the laughing corn, the luscious fruit, the active day, the restful night, the changing seasons, the silvery moon and twinkling stars to beautify the night, the radiant sun to glorify the day, and, last but not least, the companionship of loving friends—all these blessings are lavished upon us by a bountiful providence. Shall we not reciprocate to our brother man some of the happiness bestowed upon us?

If we do not we are barbarians, though we may be called Christians. But the first essential is to have a store of happiness from which to draw. It is said that happiness is like the perfume of flowers, "is very hard to conceal, and still more difficult to counterfeit." Dr. Marvin, in one of his unpublished addresses to our county society, says: "Happiness escapes with the glance of the eye, the touch of the hand, the modulation of the voice, and with many little acts unconsciously flowing from the daily life of a truly happy person. Misery is equally potent with its odors of crushed jimson. You smell it far off. As you approach some houses it affects all your senses. The front yard is full of the broken, rusty, rotten implements of husbandry, overgrown with generous vines that would hide the shame of thriftlessness, tottering doorsteps, paneless windows never blinded, and within sounds 'like the crackling of thorns under a pot.' A few hardy geraniums and climbing roses will not make such a home a paradise. There are too many temptations to vulgarity, profanity, and all the vices that breed on discordant premises. Some men are forever talking about setting out fruit and ornamental trees, but somehow whiffletrees are always barking the apple trees, and the cows are ruining the cedars. If the housewife plants a bed of pansies by the front door, the pigs root them out; and a choice plant potted in the house is crushed under a wet overcoat, the first rainy day in March. The first step towards æsthetics is a decent regard for woman's rights."

#### DISCUSSION ON MR. REYNOLDS'S PAPER.

J. W. BYRAM, Cedar Point: Orchards should be cultivated until the trees come to a bearing age, and then sown to red clover.

J. M. SHEPPERD, Abilene: My oldest orchard was planted seventeen years ago. The trees are in rows twenty-two feet apart; have not been cultivated for several years. They are vigorous and productive. Clover should be sown among trees when they are young, and will permit the ground to be worked occasionally. Prune out all chafing branches, cultivate well, manure or seed to clover, and success will follow.

WM. GOULD, Ottawa: All pruning should be done when the branches are small, to avoid making large wounds.

DR. REYNOLDS, Junction City: Varieties of apple trees differ constitutionally in form and development. Some possess a large amount of surface roots, while others push them into the lower strata of the land, permeating the subsoil. Clover, having a long tap-root which reaches into the subsoil, draws food from the depths as well as from the air, and hence it is an advantage to some varieties.

PROF. J. W. ROBSON, Cheever: Clover draws most of its food from the atmosphere. It should be cut and allowed to rot on the land, to become a fertilizer. An orchard becomes more pleasing to the eye where the land between rows is covered with clover, than when allowed to run to a mass of promiscuous weeds. But I prefer clean culture to any kind of crops among trees.

M. B. NEWMAN, Wyandotte: Vegetation acts as an organizing agent of matter, preparing it for plant food, hence is useful; and the important question for us to determine is, What species are best fitted to render such service? Clover has been regarded as one of the most valuable.

F. WELLHOUSE, Fairmount: Cultivation in an old orchard is impracticable. Clover absorbs gases from the atmosphere, and they are held by the plant, and when it is cut down it should be plowed under, that in dissolution by the process of decay its elements may be incorporated with the soil.

#### MEANS FOR THE SUPPRESSION OF THE CANKER WORM.

On motion, the paper of Mr. Ashby on the Canker Worm was called up, and discussed as follows:

F. WELLHOUSE: I have used London purple as an insecticide. I bought six hun-

dred pounds, at a cost of 8½ cts. per pound. A quantity was placed in tanks and water applied as long as absorbed by the purple; this was then mixed with water in the proportions of two pounds to every seventy gallons of water, and the solution placed in tanks having a force pump attached, mounted on a wagon, and driven down one side and back on the other of each row of trees, while the solution was sprayed onto the foliage through the force pumps.

MR. ASHBY: I wish to state that any proportion having less water to the amount of purple than that named by Mr. Wellhouse will ruin the leaves of trees.

J. W. ROBSON, Cheever: Bluebirds are valuable helps in the extermination of the canker worm; the chickadee also destroys them. I would advise furnishing of harbors in orchards for such birds as are wont to take to the timber for winter quarters, as the nut-hatch, which is a very active bird among trees in winter. The king-bird and butcher-bird are helps; and I would emphasize my former assertions of the value of the English sparrow.

H. E. VAN DEMAN, Geneva: I prefer to plant the permanent orchard rows forty feet apart each way, and fill up the spaces with alternating rows of temporary plantings, of such sorts of trees as the Missouri Pippin. They should be cultivated until seven or eight years old, and then seed the land to clover or orchard-grass. As to pruning: every application of the knife is a stroke at the tree's vitality; and large wounds lead to decay. Roots absorb water from the earth, and the leaves, gases from the air. The absorbents of roots are near the surface of the ground, and should not be disturbed.

JUDGE BEAL, Louisville: Some varieties of trees may properly be planted twenty-five feet, others thirty-three, and still others forty feet apart; twenty feet is too close. I have pruned, each year, heroically, and headed my trees four feet high, protecting their bodies with paper wrapping. I have found it necessary to prune and open the center of the heads if I want a No. 1 product; and people speak of my fruit, grown in this way, as fine. I have manured my pear trees, and pruned about the same as I would an apple tree. They are now fourteen years old, and healthy. I have the Bartlett, Vicar of Winkfield, Louise Bonne de Jersey, and White Doyenne, which have been treated liberally with stable manure, thrown broadcast around them.

On motion, adjourned to 2 P. M.

## AFTERNOON SESSION.

THURSDAY, June 5, 1885.

Vice President Newman in the chair, who announced the reading of the following report of the Committee on Geology:

### THE FORMATION AND TRANSFORMATION OF SOILS.

BY L. A. SIMMONS, WELLINGTON.

Geology is concisely defined as "the science which treats of the structure and mineral constitution of the globe, the causes of its physical features, and its history." There are two distinct branches of study involved in this attractive science. One consists of the physical, chemical and biological laws which have presided over the development of the globe; and the other of the natural history of the earth, as displayed in its physical structure, its stratigraphy, mineralogy, and paleontology.

A study of physical geography, at least so far as that science treats of the distribution of land and water upon the surface of the earth in past and present times, and the winds, currents, and climates, is evidently essential as a preliminary; for some knowledge of



these must precede an intelligent investigation of the different kinds of rocks, their arrangement and structure, their succession and relative antiquity, and their chemical and mineralogical history. Further, the science of geology inevitably involves a careful study of the chemical agencies, which were active in the formation of the various kinds of rocks and minerals, which induced and effected the almost infinite number of changes which have taken place in the organic elements; and these must be considered in connection with the physical forces which have arranged the position and governed the structure in the course of the several formations.

Without attempting even to outline the ramifications of this most interesting science, or more than glance at the coördinate sciences involved, we approach the subject of geology, as applicable to horticulture, by directing attention to the fact that the whole science necessarily deals with the bare surface, or a thin crust of the earth; for it is beyond the power of mortals to penetrate for any purpose the body of the globe as the plum gouger does the luscious fruit upon the tree. Yea, the minutest insect, which has barely punctured the skin or sun-painted surface of a large apple, has comparatively more deeply investigated its entire mass than have mankind, even by their deepest mining or soundings, learned the constituent elements which compose this stupendous body of matter, which Infinite Power has sent whirling around the sun at the inconceivable velocity of 69,000 miles per hour.

Now it might be supposed that only a few feet in depth of this bare crust of the earth which is the subject of geological investigation, or the portion commonly known as the soil, is alone worthy of special study by the horticulturist: for it might be contended that it is not of the slightest importance what the nature of the rocks are at such a depth below the surface that the roots of the largest trees cannot reach them; and it might be urged with much show of plausibility that, as it is only a few feet of the surface which can as soil furnish plant food and thereby contribute to the growth of our fruit-bearing trees and shrubs, if we could thoroughly understand the constituent elements or composition of this portion, we should have all the education in this direction which is especially desirable, or of any practical value.

The fallacy of this position will speedily appear when we undertake the investigation of soils, and in this respect alone is geology strictly applicable to horticulture. By the term soils we designate that portion of the earth's surface which is susceptible of cultivation, or contributes to plant growth. They are usually defined as sandy, clayey, or calcareous, and the upper portion is scientifically known as *humus*. Now, taking it for granted, for the sake of the argument, that sand, clay and lime are the principal ingredients of all soils, and we come to the question, What are the component parts of each, and how did they originate?

Sand is but silica, or composed of minute portions of siliceous rocks, including not only quartz, but feldspar, granite, and many others, which in the course of unreckoned ages have been disintegrated but not completely pulverized by physical and chemical agencies. Pure sand is nothing but a mass of very small pebbles, usually rounded and smoothed by contact with each other, but still retaining the primitive nature of the greater rocks from which it originated. So also clay is but the residuum or sediment resulting mainly from the chemical decomposition of rocks and minerals, differing only from sand in the fact that the particles composing it have become so fine—so nearly impalpable—that their constant tendency is to adhere and form a plastic mass. And finally lime, which enters so largely into the composition of all productive soils, usually in combination as a carbonate, sulphate, or phosphate, originates in the disintegration and decomposition of a class of rocks which usually contain shells and many traces of the flora and fauna of an ancient period in the earth's history, combined with the elemental portions of rocks of some preceding era.

So at length we come to the rocks which compose the crust of the earth, and must learn

their ingredients if we would know the nature of the soil in which we plant and cultivate our trees, shrubs and vines. Hence, we lay down this principle as indisputable, that whether the soil of any region is sandy, or clayey, or calcareous, a careful investigation will show that the rocks underlying it consist to a considerable extent of the very same ingredients.

Before pursuing this study of soils further, let us consider briefly that portion only of the surface which is constantly perforated by myriads of worms, and turned by the plow so that it not only absorbs largely the rainfall, but is subjected to the action of the air, and in the temperate zones is frozen solid during a portion of each year. It is usually of a dark color, sometimes nearly black; is generally by scientists termed *humus*, while to the common farmer it is the soil, and immediately beneath it a subsoil. In our scientific works it is ordinarily said that *humus* consists largely of partially-decayed vegetable matter, and so we are led at once to infer that as generation after generation of plants have grown and decayed, or in our prairie regions have been burned when dry, or fallen down and become partially decomposed, in the lapse of untold ages this inorganic matter has accumulated and come to cover as a mantle the whole surface.

Now, with all due respect to its originator and advocates, let me say that I do not accept this theory of the origin of *humus*. While admitting that there is some truth in it, I contend that *the result is too great for the alleged cause*; for to me it seems absurd to suppose that the ashes of the grass and weeds, together with all the vegetable matter resulting from the decay of all sorts of animal vegetation, has accumulated the deposit of from one to three feet in thickness upon the entire surface of our vast prairies.

My own view as to its origin, is that at some period in the past, and perhaps no very distant one, the whole of both soil and subsoil were identical in composition, being the clayey sediment produced by the pulverization of rocks and minerals of the same or some not very distant region; that the earth-worms perforated and fairly honeycombed the mass to and even below the depth to which it was annually frozen; then the air penetrated their burrows, and the rains came and carried down into them possibly some trace of vegetable matter; but this I consider scarcely probable at the outset. From the action of the air and water upon the surface, and as admitted into the clay by the borings of the worms, chemical action was excited, and a speedy change took place in the original sedimentary deposit, so that a very slight portion of the surface became capable of producing a low grade of vegetation. This, though it might have been for a long period but a species of moss, was able to collect and retain particles of matter drifted and driven here and there by the winds. And so the worm-working, the rainfall, the atmospheric changes, all inducing constantly repeated chemical action, the change went on, and a stronger and more vigorous growth of vegetation year after year ensued.

So while I concede that the partial decay of vegetable matter may have produced a small portion of the surface soil known as *humus*, I consider it but an auxiliary cause, while in chemical action I find the power which has induced and carried forward the transformation. Does any one doubt the energy of chemical action, let him look for a moment at the simple process of slacking lime, and he will behold a lively illustration of the processes which are constantly going on all over and beneath the surface of the earth.

This view of the changes of soil finds a strong corroboration in the alterations which have taken place within the recollection of many here present, in the soils of our own State. In the geographies of fifty years ago, all of this State except what now constitutes the three eastern tiers of counties was described as "The Great American Desert," whose boundaries upon each of our old maps seem to extend from less than 100 miles west of the Missouri river to the Rocky Mountains. The pioneers, those who traveled across the Plains on the old Santa Fé trail, only thirty or forty years ago, assure us that within two days' journey of the Missouri river they came to the region covered only

with buffalo grass, except along the streams finding no other variety. With the advance of the settlements to the westward in our State, as we all know, the variety of grass commonly known as blue-stem has struggled to keep pace, and where the settlements have attained the age of a quarter of a century, we find the blue-stem in turn superseded by what are known as the tame grasses, and especially by blue-grass.

Now is it possible to believe that the geographers of half a century ago were wholly misinformed, and mistaught us? Shall we reject the statements of the earliest pioneers as untrue? No, no; let us deal charitably with them, and accept the rational theory that the *humus* which covers the surface in our State has gradually been produced by the marvelous chemical changes in the surface by the energies of those wonderful affinities well known to exist among the diverse mineral substances which lie in and near the surface, as well as the gases which emanate from such action, as, for instance, the combination of the nitrogen of the air with the hydrogen of water as existing in the air in the form of vapor, either as dew, fog, or mist, generating *ammonia*, whereby a higher and still higher order of vegetation has been sustained, and the native soil made from one decade to another more and more generous and productive.

Now if this theory is correct; if, as we have seen, in a brief period such remarkable changes, such wondrous transformations are effected on the plains of Kansas, with no other cultivators of the soil than the earth-worms burrowing in the surface, what still more wonderful changes may be developed with the plow, the harrow, and by the intelligent use of such minerals or manures as will excite in the surface soil the still higher or more perfect operation of the ever-active chemical agencies, which produce such marvelous and beneficent transformations? Have we not here an intimation—yea, almost positive proof—that we may, as horticulturists, by the means above mentioned so improve, or rather aid, the forces of nature in improving the soil, that all our fruit-bearing trees and shrubs therein planted will have a remarkably healthful and vigorous growth, and produce the finest and most delicious fruit which the sun has ever ripened in the temperate zone?

Bear with me, friends, a few moments longer, for I feel that I should not properly conclude this paper without a few words in respect to the formation directly beneath the *humus*, and known as the subsoil. I have found by actual experiment, that the clay composing the subsoil in my own neighborhood may speedily be made productive. Portions taken from two, five, and even ten feet below the surface, need only a year's exposure to the air, the rains, and the action of frost, and they become capable of supporting vegetation, and with thorough cultivation give it a vigorous growth. How the sunflowers grow, after a year or two, upon the clays thrown out by deep railroad excavations! Even the calcareous shale underlying our clays readily disintegrates and dissolves when brought to the surface, and in two or three years becomes so transformed that the beans which I planted in it made a rapid growth. These tests demonstrate the wonderful capabilities of our subsoils, which, as true horticulturists, it is our province, if not our duty, to develop.

Though I have passed the meridian of life, and feel as did the old Roman poet, that "the swiftly fleeting years" to me allotted are "rapidly gliding by," yet I hope to live to see the day when subsoiling will be generally practiced; when each man who proposes to plant a grove, an orchard, a berry-field, or a vineyard, will understand that if he would attain the highest degree of success, he must prepare his ground thoroughly, and *commence that preparation by DEEP SUBSOILING.*

This done, our drouths can almost be defied,  
Our trees thus find their natural wants supplied;  
Their yield more bountiful, nor flavored less,  
The homes we love they'll most protect and bless:  
Kansas stands forth, most favored of all lands,  
Where laboring brains direct all laboring hands.

## REMARKS BY PROFESSOR HAY, OF JUNCTION CITY.

I am well pleased with the paper just read. The causes which have produced our soils are climatic, and have been formed through a gradual reduction of the rocks. This process can be illustrated by wetting a stone just at night, and when dried off a film will be discernible. Let this process be continued, and dissolution will continue. The influences of the occupancy of the earth by man, with the usual forces put in motion, have had a tendency to assist the natural forces. Plowing of the land only exposes more surface, and hence a greater progress is made.

At the close of these remarks, the President's semi-annual address was delivered.\*

On motion, the address was referred to the following committee: J. W. Byram, D. G. Watt, and Abner Allen.

The President announced the following paper by G. W. Ashby:

## A MIXED ORCHARD.

It has been a favorite theory and practice of many planters, and may be at this time, to combine the planting of peach and apple. The alleged advantage in this mode is the protection of the apple tree from the bad effects of exposure of sun and winds afforded by the more rapid growth of the peach, when from the shortness of its life it can be removed, the apple having attained a more self-sustaining position in life. The theory appears plausible, but practically the effect is bad. This last has been forcibly brought to my attention from recent inspections of orchards in my locality, where the planting of the peach had been alternately commingled with the apple, in which the apple trees were more or less unhealthy, and always of a diminutive growth compared with adjoining orchards where the apple had been planted alone, and cultivated. In the earlier stages of an orchard's growth the bad effects are not so perceptible; but after ten years it becomes more marked. In the diminutive growth of the apple tree the indications are that the peach is a rapid absorber of the nutritive elements of the soil, to the detriment of the apple. In its unhealthfulness the peach is a *great breeder of pestiferous insects*.

The peach is rapid in maturing and early in decay, when it becomes the abiding-house of all perishing matter. The worm and the diseases of the peach are not necessarily incident to the apple, still its presence appears detrimental to its fullest and best development.

In the comparative examination of apple orchards in my locality, I find a wide difference between apple orchards in their general aspect and condition. In those that are strictly confined to the culture of the apple, the condition is at least 33 per cent. for the better than those of mixed planting. Bodies or belts of timber for an exterior protection to a growing orchard are highly beneficial, but the intermingling of the peach with the apple for this purpose is injurious: the peach will do well, but the apple badly.

I believe this system of planting should be discouraged. It is easy to make a mistake in many matters in horticulture, which years will be required to demonstrate. The growth of the apple in combination with any other tree I believe to be of doubtful propriety, and even then they have their characteristics that are worthy of study. The Carolina Red June will accept a more immediate location for a neighbor, a fellow Red June, than the Winesap will of its kind: the latter appears to require more space for future action. I believe an orchard planted with apple trees 25 feet apart each way is considered to have been done in accordance with horticultural regulations of the State of Kansas; but I know Winesap trees planted eighteen years ago, and thirty-three feet apart, that are now quarreling with one another for elbow-room, and they, to all appearances, are yet in their youth.

\*The address will be found in the Appendix to this volume.

Just here I wish to refer to the peach culture as is observable in southeastern Kansas. We there are somewhat proud of our distinction as a peach-producing locality, but up to date, there have occurred intervals when the product of the peach orchard was discouraging. The third successive crop of any material value has not yet been produced; even the second successive one is largely a faulty one. Can we expect a profitable peach crop?

At the semi-annual meeting of this Society at Olathe, one year ago, I reported for Neosho county a fair crop of peaches, which was then true; but the outcome was a total destruction of all peaches by the larvæ of the curculio, with the exception of a few among the latest varieties. At this time the curculio is the terror of the peach grower. How long it will continue is somewhat a matter of conjecture. Those who can safely rank themselves as old settlers of Kansas can truly say, they have seen the drouth, the chinch bug, the grasshopper, the rose chafer, the croaker, and flat-headed borer come and go, and the appearances now are that the curculio, with the canker worm, is going. These problems have all been solved within the past quarter of a century, and with their solution have been developed possibilities so vast that we are bewildered at the teeming results of our success.

#### REPORT OF COMMITTEE ON FRUIT EXHIBITS DURING THE MEETING.

The committee would report that they find the tables well filled with samples of the fruits named and accredited to the following counties. We desire to say that all the specimens are very fine:

*Davis County.*—Theo. Jones shows the Ben Davis, Willowtwig, White Winter Pearmain, and Rawle's Genet. Cutter & Jones show the Fink, and strawberries. H. H. Bingham & Co. show plate of Wilson's Albany and Crescent strawberries. Mr. Shepperd, of Abilene, shows several fine twigs of apples, cherries, plums, currants, and gooseberries.

*Douglas.*—B. F. Smith exhibits Cumberland Triumph, Boyden, Sharpless, Miner's Great Prolific, Ironclad, Wilson's Albany, Prouty, Charles Downing, Crescent, and Mount Vernon strawberries.

*Dickinson.*—J. N. Shepperd shows the Ben Davis, Missouri Pippin, Rawle's Genet, Gilpin, Willowtwig, White Winter Pearmain, and American Pippin.

*Ellis.*—Martin Allen shows from this frontier post, good specimens of peaches, cherries, gooseberries, apple twigs bearing fruit, the plum, and native black currant.

*Neosho.*—James Truitt shows fine samples of Truitt's Surprise, Sharpless, Duchess, Cumberland Triumph, and the Bidwell strawberries.

*Reno.*—W. E. Fosnot shows good samples of strawberries, cherries, apples, crabs, seedling peaches; also the Sand, Wild Goose, and Blue Damson plums, and the apricot and Concord grape, contributed by A. M. Switzer, C. Bishir, and others.

*Clay.*—Mr. Walters shows samples of potatoes and onions.

J. W. BYRAM,  
S. B. KOKENOUR,  
F. WELLHOUSE,

*Committee.*

The report of Prof. John W. Robson, Standing Committee on Botany and Vegetable Physiology, was read, as follows:

#### THE FRUITS OF THE TROPICS.

Of all the departments of natural science, there is no single one capable of exercising such an advantageous influence on the mind and labors of the horticulturist as the science of botany. Not a step can he advance in it but he meets with wonders previously unsuspected; not a height does he gain, from which his prospect is clearer and more extensive, but his conception of these wonders acquires a yet more astonishing vastness.

The more he knows, the more he wants to know; and the further he advances in the study, the more does he perceive how much delight is yet in store for him.

The beneficent Creator has ordained that every part of His works should be good; that the fruits of plant, shrub and tree should contribute in the highest degree to the pleasure and well-being of His creatures in every clime. He has given toothsome and luscious fruits to the inhabitants of the temperate zone; and to those of our race living under a tropical sun, which distills so many costly juices and spices, fruits are produced in prodigal abundance, of a rich and delicious flavor.

The Custard-apple (*Anona squamosa*) belongs to the order Anonacæ, and the whole tribe is confined to tropical climates, with the exception of our native pawpaw. The custard-apple of the East and West Indies is a refreshing fruit, combining an agreeable acidity with a delicious sweetness.

The Peruvian Chirimoya (*Anona tripetala*) is vaunted by botanical travelers in such terms of admiration that it can hardly be inferior to, and probably surpasses, the most exquisite fruits of European growth. Markham calls it "a spiritualized strawberry." Hauke calls it in one of his letters "a masterpiece of nature;" and Schudi says that "its taste is quite incomparable." The tree is about twenty feet high. The fruit is heart-shaped, with the broad base attached to the branch; it attains a weight of from fourteen to sixteen pounds; the rind is green, covered with small scales, and incloses a snow-white, juicy pulp. Both fruit and blossoms exhale a delightful odor.

The beautiful Mangosteen (*Garcinia mangostana*) is a native of the Moluccas, and has been transplanted all over the Indian Archipelago. At a distance it resembles the citron tree, and bears large flowers like roses. The dark-brown capsular fruit, about the size of a small apple, is described as of unequalled flavor—juicy and aromatic like a mixture of strawberries, raspberries, grapes, and oranges. It is said that the sick patient who has lost an appetite for everything else still relishes the mangosteen, and that the case is hopeless when he refuses even this.

The stately Mango (*Mangifera indica*) bears beautiful girandoles of flowers, followed by large, plum-like fruit. Several varieties are cultivated, varying in size, weighing from a few ounces to several pounds. When ripe they have a most delicious, aromatic, sweet, and slightly acid taste. It is held in high esteem by the Hindoos.

The *Durion*, until lately, has been an unknown fruit-bearing tree to the botanists of Europe and America. No other fruit possesses the opposite qualities of extreme offensiveness to one sense, and of the highest gratefulness to the other sense most closely allied to it. Its smell is like that of rotten onions, while its taste is such that those who have once partaken of it prefer it to all other fruit. Wallace, the botanical explorer, thus describes it:

"The *Durion* grows on a large and lofty forest tree, somewhat resembling an elm in its general character, but with a more smooth and scaly bark. The fruit is round, or slightly oval, about the size of a large cocoanut, of a green color, and covered all over with short, stout spines. It is so completely armed that, if the stalk is broken off it is a difficult matter to lift one from the ground. The outer rind is so thick and tough that from whatever height it may fall it is never broken. From the base to the apex five very faint lines may be traced, over which the spines arch a little; these are the sutures of the carpels, and show where the fruit may be divided with a heavy knife. The five cells are white within, and are each filled with an oval mass of cream-colored pulp, imbedded in which are two or three seeds about the size of chestnuts. The pulp is the eatable part; and its consistence and flavor are indescribable. A rich, butter-like custard, highly flavored with almonds, gives the best general idea of it; but intermingled with it come wafts of flavor that call to mind Limburger cheese, onion sauce, and other incongruities. Then there is a rich, glutinous smoothness in the pulp which nothing else possesses, but which adds to its delicacy. It is neither acid, nor sweet, nor juicy, yet one feels the want of none of these qualities, for it is perfect as it is. It produces no nausea or other bad effect, and the more you eat of it the less you feel inclined to stop. In fact, to eat *durions* is a new sensation, worth a voyage to Borneo to experience."

The Grenadilla (*Passiflora alata*) is a native of the great valley of the Amazon river.

Being a creeper with tendrils, it ascends to the tops of the highest trees. The fruit attains the size of a man's head, and is intensely green in color. It is composed of a sweet and slightly acid pulp, which renders it very refreshing; the rind, which is also a little acid, is cut into slices and made into tarts, which have somewhat the flavor of those made of apples.

The Bread-fruit (*Artocarpus incisa*) is the great gift of Providence to the fair isles of Polynesia. No fruit or forest tree in the United States, with the exception, perhaps, of the oak or elm, is its equal in regularity of growth and comeliness of shape; it far surpasses the chestnut, which it somewhat resembles in appearance. Its large, oblong leaves, frequently a foot and a half long, are deeply lobed like those of the fig tree, which they resemble, not only in color and consistence, but also in exuding a thick, milky juice when broken. The fruit is about the size and shape of a large nutmeg melon. The eatable part lies between the skin and the core; it is as white as snow, and somewhat of the consistence of new bread. Wallace, who found it growing on the island of Amboyna, thus apostrophizes: "Here I enjoyed a luxury I have never met with before or since—the true bread-fruit. It is baked entire in the hot embers, and the inside scooped out with a spoon. I compared it to Yorkshire pudding; others thought it was like mashed potatoes and milk. It is about the size of a melon, a little fibrous toward the center, but everywhere else quite smooth and puddingy, something between yeast dumplings and batter pudding. With meat and gravy it is a vegetable fruit superior to any I know in temperate or tropical countries. With sugar, milk and butter it makes a delicious pudding, having a slight and delicate but characteristic flavor, which, like that of good bread or potatoes, one never gets tired of." This fruit is in season eight months in the year.

To procure this principal article of their food costs the fortunate natives of the tropics no more trouble than plucking and preparing it in the manner already described; for, though the tree does not grow spontaneously, yet, if a man plants but twelve of them in his lifetime, he will, as Captain Cook remarks, "as completely fulfill his duty to his own and future generations as the native of our less genial climate by plowing in the cold of spring and reaping in the summer's heat as often as the seasons return."

The wonderful luxuriance of tropical vegetation is perhaps nowhere more conspicuous and surprising than in the magnificent Banana (*Musa sapientum*), and the imposing Plantain (*Musa paradisiaca*), whose fruits most probably nourished mankind long before the gifts of Ceres became known. A succulent shaft or stem, rising to the height of fifteen or twenty feet, and frequently two feet in diameter, is formed of the sheath-like leaf stalks rolled one over the other, and terminating in enormous light-green and glossy blades, ten feet long and two feet broad, of so delicate a tissue that the slightest wind suffices to tear them transversely as far as the mid-rib. A stout foot-stalk, arising from the center of the leaves, and reclining over one side of the trunk, supports numerous clusters of flowers, and subsequently a great weight of several hundred fruits about the size and shape of well-grown cucumbers. On seeing the stately plant, one might suppose that many years had been required for its growth; and yet only eight or ten months were necessary for its full development. Each shoot produces its fruit but once, when it withers and dies; but new shoots spring forth from the roots, and before the year has elapsed unfold themselves with the same luxuriance. Thus, without any other labor than now and then weeding the field, fruit follows upon fruit, and harvest upon harvest. A single bunch of bananas often weighs from sixty to seventy pounds, and Humboldt has calculated that "thirty-three pounds of wheat and ninety-nine pounds of potatoes require the same space of ground to grow upon as will produce two thousand pounds of bananas."

The Pine-apple (*Ananassa sativa*) is very widespread in the tropical portions of the Old and New World. This delicious fruit consists of the entire spike of flowers, with

bracts and stem blended into one fleshy mass, with a miniature plant issuing from the upper part of the apple, called a crown. It was introduced into and cultivated in Great Britain about the end of the seventeenth century; but at the present time, the skill and attention of British horticulturists have rendered the fruit which they grow more prized for size, flavor and elegance than that grown in its native climate. Each fruit weighs from five to ten pounds.

The *Palmyra* Palm is the sacred tree of the Brahmins. It is found in every region of Hindostan, from the Indus to Siam. The *Palmyra* rises gracefully to its full height of seventy or eighty feet, and presents a truly majestic sight when laden with its huge cluster of fruits, each the size of a Yellow Bellflower apple, and of a rich brown tint, fading into bright golden at its base. The Hindoo poets have all united in celebrating the numerous blessings it confers upon mankind.

The Date-tree (*Phoenix dactylifera*) has been sung from time immemorial by the poets of the East. It is as indispensable as the camel to the inhabitants of the wastes of North Africa and Arabia, and next to the "ship of the desert," the devout Mussulman esteems it the chief gift of Allah. Few palms have a wider range, for it extends from the Persian Gulf to the borders of the Atlantic. It thrives best and bears larger crops of fruit in the oases on the borders of the sandy desert. Here it is cultivated with the greatest care, and irrigated every morning; for, though it will grow on an arid soil, it absolutely requires water to be fruitful. It is not to be wondered at that the tribes of the Sahara so highly value a tree which, by enabling a family to live on the produce of a small plot of ground, extends as it were the bounds of the green islands in the sea of sand, and rarely disappoints the industry that has been bestowed on its culture. It is remarkable for the prodigious development of its organ of fructification. A single bunch of the stamiferous flowers of the date has been estimated to bear about 12,000 blossoms. It is considered criminal to fell the tree when in full vigor, and the Koran forbids the warriors of the true god to apply the ax to the date trees of an enemy.

The group of fruit-bearing plants composing the natural order *Aurantiaceæ* is readily distinguished from all others. It is one of great value to man, on account of the large quantity of grateful and refreshing fruit and cooling and reviving draughts which they supply him in the very climates where they are most needed. They are remarkable as being the only tropical fruit which can be safely shipped into the Northern States in a perfectly ripened condition, and at a cost but little exceeding our common fruits; and while they thus offer a gratification within reach of the poorer classes, they are also so superior to other tropical fruits that they cannot be despised for their cheapness, even by the wealthiest.

The Lemon (*Citrus limonium*) and the Lime (*Citrus limeta*) are much esteemed in all countries for the large amount of citric acids which their fruits contain. The juices are largely used in the navies of the world. The various species of the Orange family are almost all natives of the East Indies and China, whence they have been transplanted in all the countries within or near the tropics. In the West India Islands the Citron, Lime and Shaddock are most successfully cultivated. The orange groves of Florida are increasing in number every season, and still the demand for this delicious fruit is greater than the supply.

The Fig (*Ficus carica*) is a native of the warm portions of Asia, and other warm portions of the globe. It will doubtless surprise those who have not made botany a study, to learn that the fig, hop, mulberry, hemp, and bread-fruit belong to the nettle family, and also that the inflorescence of the fig cannot be seen except by cutting the fruit open with a knife, the flower being concealed inside of the embryo fruit. The fig is an important article of food in many of the eastern countries of the Old World, and tens of thousands of tons of the dried fruit are annually exported. In Great Britain it is grown



in the open air, trained upon walls, and also under glass. The Brown Turkey, Ischia, and Brunswick are the most popular among the growers. The pomologists of Florida are growing this luscious fruit with success and profit. Preserved in a new and delicious manner, they are now being sold in every Northern State of the Union.

—These are the leading fruits of the tropics. Man has done but little to improve by care and art these gifts of nature, and, with rare exceptions, the delicious flavor and sprightliness of our own fruits is found wanting in those of the torrid zone.

### PLUCK AND PATIENCE IN HORTICULTURE.

BY JOHN DAVIS, JUNCTION CITY.

Some people, who are in most matters sufficiently brave and persevering, appear in the practice of horticulture to show a decided lack of pluck and patience. The man who will think it no hardship to wash, curry, rub and brush the body and four legs of a horse a dozen times a week, would think it a heavy chore to wash the single stem of a fruit tree twice in twelve months. And if success in fruit culture depends upon such semi-annual attentions and labors, ten to one fruit culture is given up, and the country pronounced "unadapted to fruit raising."

The man who from habit will furnish litter to his pig from week to week and month to month, as often as he may find it necessary, and who will carry to him corn and swill two or three times a day for a whole year, can hardly be persuaded to mulch a newly-set tree, or to give it a single bucket of water at time of setting. Our children are taught to milk and feed the cows, to herd and house the sheep, to tend the hens and gather eggs, but how many lads of fifteen, or ladies of any age, can go into the fruit grounds and extract a borer, insert a bud, stick on a graft, or layer a vine, with any sort of skill?

Yet these same people do perform a great deal of labor for fruit, and the reason they are not more successful is because their efforts are too spasmodic—their tree labors and efforts are *periodic* and spasmodic, and not sufficiently *persistent*. When the warm suns of March and April begin to appear, the buds begin to swell, and the birds to sing; when all nature seems full of life and joy at the approach of spring-time, Farmer A and Citizen B feel the enlivening influences. The idea of shade trees, fruit trees, grape-vines, and ornamental plants, enters their heads. Liberal orders are sent out to the nursery-men who supply such things. *Large trees* and plants are ordered, for in their new-born energy they mean to realize results *at once!* They don't care for price, but they *must have large trees*, four or five years old—and vines not less than two, and would even pay extra for four-year-olds. The order made out and sent off, their energy is half expended. A cold snap of weather sets in. The ground freezes of nights—the days are cloudy, misty and dismal; yet plant men find it a good time to handle trees. On some chilly, melancholy afternoon the trees arrive: the bills, for trees and for freight, are presented. These bills are of course in proportion to the size of the articles ordered and shipped. Under the influence of the prevailing atmosphere (the wind is always from the east on such occasions) charges are pronounced exorbitantly large. Nurserymen and railroad men are abused in unmeasured terms. Contracts are scanned, but everything being snug in that quarter, the trees are received and dumped into the back yard and left there. I have known men who, in such cases, would never touch them again, except to make ox-goads and riding whips; spending the remainder of their days in berating the country for being no fruit country. But Mr. A and Mr. B are not so spiritless as that. After nursing their wrath a day or two they become reconciled, and determine on new efforts. The weather has brightened—the wind is from the west, dry and bracing. The bundles are opened—"rather dry, but I guess they will grow. Better set 'em out anyhow." And they *are*, accordingly, *set out*—not as a matter of enjoyment, of love, or of hope,

but as a distasteful duty, a mere piece of drudgery to be performed and forgotten as soon as possible. Plants being large, the best efforts in digging could only obtain roots small in proportion to tops. Yet, such as they are, they quite fill the capacity of the holes prepared for them. They are set *deep*, that they may be sure to grow; the clay that came from the bottom of the holes is returned to the same place, in the speediest manner. The surface, wet or dry, is well tramped to hold all solid—no mulch is applied or water used. The job is done. Part of the ground is in grass, part is sown to small grain. The trees are forgotten until harvest-time. Some are dead, some are about to bud, and the thumb-nail applied to the bark tells you that they yet live; others are leaved out, but are eaten by insects. The grass and grain crops are removed. The remaining *pasture* is thought worth more than the trees, and in go the live stock—pigs, colts and calves. The trees are not all browsed and peeled, neither are they of any value; yet that soil, that climate, and that country, which will not produce bearing orchards and plenty of fruit, under such absurd management, is pronounced unadapted to fruit growing.

I am happy, however, to be able to state that there are other and better managers of trees than Farmer A and Citizen B—men who actually plan and think for the future; have the ground in tolerable order for their plants, set their trees with some care and judgment, and cultivate them a little afterwards. Such men have proven that we can raise apples and seedling peaches, but they tell us with the air of veterans that pears, grapes and berries are uncertain. Ask them to subsoil and enrich their lands; to use lime on the tardy bearers; to construct shades and to grow wind-breaks; to keep watch for borers, and to learn the difference between our insect enemies and our bird and insect friends; or to use stocks and varieties suited to the soil and locality, and they utterly refuse to advance a single step. These men have attained some success, but they utterly refuse to make any advancement, or to adopt any new ideas or processes.

Now if a person would reach the very best and highest success in horticulture, he must *love* trees and plants; must love to look at them, to walk among them and to visit them as friends and companions; to inquire into their wants and requirements, and to administer to their wants as living things.

It is said of John Randolph of Roanoke that he would go fifty yards out of his way any time to kick a sheep. John Randolph would not have been a successful keeper of sheep. So with trees. If a man looks upon them as so much cord-wood, and the more valuable as it is better seasoned, then he should not spend his money trying to grow trees. If a man loves a tree for its beauty, for its shade, for its fruit, and for its company, and loves to study varieties of fruits and habits of plants and trees, then he has the first rudimentary qualifications of a tree and fruit raiser, and may enter upon his work with positive assurance of success. Such a man will soon learn to do his own observing and his own thinking. In buying trees and plants he must learn to *stick to his latitude and climate!* Although trees and plants can be changed from north to south, and from south to north, yet *as a rule* there is much risk in changing accustomed lines of temperature and moisture. The orange and the lemon will not stand the northern winters, and the extreme northern trees usually suffer badly beneath the scorching southern suns. If an agent offers you fig trees and peach trees from latitude thirty to be used on thirty-nine or forty, or Russian apples from latitude fifty to be used in central Kansas, you had better get your neighbors to try the first experiments. There are plenty of them who will bite at the tempting and costly bait, and you will witness the experiments without risk to your pockets. There is no doubt but that many plants from the north and from the south will succeed well in central Kansas; like the Osage orange from Texas, for hedges, and the Russian mulberry, for fruit, foliage, and timber. But these are two exceptions from a thousand failures. Russian apple trees will sometimes grow and bear fruit here, but I have never yet heard of a Russian apple standing prominently

at the head of the list for excellence, anywhere south of British America. Kansas has no necessity for the northern ironclads. It would be far more sensible to select salamanders, with leathern leaves and asbestos bark. Varieties of fruit for Kansas, as a rule, should be selected among the older States, south of forty-two and north of thirty-six degrees. We are in the latitude and longitude of bright suns and a dry, bracing atmosphere. Our fruits should come from inland continental countries. We are in the paradise of grapes and peaches, and yet the grapes of western Europe and the island of Madeira are not successes here. Our suns are too bright and our atmosphere too bracing for the thin, tender leaves, and our winters too sharp for their insular constitutions. The grape is an extreme case, illustrating the *tendencies* of things more or less applicable to other fruits. The berries succeeding best in England and northern Europe are tender here under our hot suns and penetrating drouths, and should be shaded by fences, buildings, trees, or artificial screens. For pigs and cattle we build sheds and stables, and think it no hardship, but were I to recommend the shading of a dozen square rods with lumber or brush, to break about three-fourths of the power of the sun, letting broken rays fall through cracks and crevices, in order to insure bountiful crops of strawberries, currants, gooseberries, and raspberries, the suggestion would be hissed, and these healthful fruits would be branded as failures.

I pass to another point. We have selected our trees. They are before us. They consist of roots, stems, and tops. The roots are to go into the ground and represent the chances for life. The tops are to be exposed to the weather, to the insects, and all the enemies of plant life. Other things being equal, then the more and better the roots and the smaller the amount of tops, the more certain the trees are to grow when set out.

My first tree experiment in Kansas was the transportation and planting out of 20,000 yearling apple trees. They were bundled in fifties, and the tops chopped off like hedge plants. They were set with the stump even with the surface of the soil. They all grew. And besides that, we saved two-thirds of the freight bill—a clear case of cheating the railroads. But, says one, you have lost three feet of growth. In theory we have—in practice we have not. Such plants make a clean, healthy growth of from two to four feet the first summer. Yearling apple trees with whole tops do pretty well if they hold their own and grow from two to ten inches. And at the end of the second summer the cut-back plants have caught up, and are by far the cleaner and better-looking trees. But there is one point that must be attended to. The cut-back plants will start with a cluster of sprouts. All but the best one must be rubbed off early in the summer—say the last of May or the first of June. Everything depends on this item. Without it the plan is an utter failure.

But for an orchard we use two or three-year-old trees, and such trees should always retain the stem and some top. There is no need of beginning at the bottom round of the ladder in starting an orchard. The first point is to cause the trees to unite with the ground, as they were united with the soil in the nursery. You should select a soil fit for a good crop of corn or potatoes. The ground for each tree should be well plowed or dug, and a hole should be opened for the reception of the tree. The tree should be placed as deep or a little deeper than it stood in the nursery. When the root is well covered with the best soil, and the hole is about half filled with dirt, two or three pails of water should be poured into the hole and allowed to soak away. This unites the soil about the roots and rootlets of the trees better than man can do it. After the water has thoroughly soaked away, the hole should then be filled up level with the surface of the ground, or nearly so. After this, the trees should be cultivated as any plowed or hoed crop. If this is not practicable, each tree should be hoed around or mulched.

I have been asked to give a list of fruits, and especially apples. I shall not do it now; but if for market, choose red, showy fruit, of sorts that bear the most bushels—like the

Ben Davis. If for your own use, then suit your own taste—choosing flavor and quality instead of quantity and brilliancy—like the Fink, Rawle's Genet, etc. Tastes differ, but men in market usually buy apples with their eyes, choosing brilliancy instead of quality. Choose apples of all seasons. You may begin to cook early apples in July, and the Fink as a keeper is said to have been shown in good condition in May, after being kept over two winters—so that, with proper care, it is not difficult to have in your cellar at the same time, "apples both new and old," and all in good condition for the table and market. But let the main crop for market be good winter apples, with a heavy proportion of the latest keepers. During the past month, one of our Davis county orchardists has been selling apples by the wagon-load in his home market at \$2 per bushel. This is another case of getting ahead of the railroads! Late keepers, running into the spring and summer of the next year, always have the longest and best market, and the least competition with other fruits. They also stand shipping best, and thus have a wider market and a chance to choose markets.

I have merely hinted at the main elements of success in fruit raising. Then comes the question of wind-breaks, shade trees, and timber culture. Study the subject from books—they are cheap and plenty—look around you and see what trees succeed best, and are most valuable. The elm, soft maple, cottonwood and ash-leaved maple are successes. They make shade quickly, and the timber is better than nothing for many purposes; but for value as a forest tree, and for certainty and cheapness of culture, the black walnut stands at the head of the list. If I were asked to name the ten best varieties of plants for a strong farm hedge, I would name the Osage orange just ten times. So if asked to name the ten best trees for forest culture in central Kansas, I would name the black walnut at least six or eight times. At six years old they are useful for a dozen purposes, and at that age they begin to bear fruit. And then, when cut for use, the stump sends up another tree with great vigor.

But I conclude where I begun—the main requisite in tree and fruit culture is in the MAN. *He must love the business*, and he must have pluck and patience in attending to the practical details as they are required; and as a fertilizer for his soil he must use brains—human brains—highly seasoned with common sense.

On motion, the following resolutions were unanimously adopted:

*Resolved*, That we, the members of the Kansas State Horticultural Society, most respectfully petition the next State Legislature to provide for a thorough geological survey of the State.

*Resolved*, That the Secretary of this Society be requested to correspond with the Director of the U. S. Geological Survey, respecting the employment of a party of that service in the State of Kansas at an early day.

#### COMMITTEE ON FINAL RESOLUTIONS.

On motion, the following committee was appointed to prepare final resolutions: O. A. A. Gardner, Belleville; H. E. Van Deman, Geneva; N. M. Chandler, Ottawa.

The Standing Committee on Forestry, Hon. M. Allen, of Hays City, offered the following resolutions:

*Resolved*, That we, the State Horticultural Society, now in session at Junction City, Kansas, look upon the recent action of our members of Congress, in relation to the repeal of the timber-culture act, with feelings of distrust and disappointment.

*Resolved*, That it is the sense of this meeting, assembled from all parts of this great commonwealth of Kansas, that this law ought not to be repealed; but that when once a timber claim is entered under this law it should not thereafter by relinquishment become liable to entry under any other act.

*Resolved*, That the Secretary of this Society is hereby instructed to place copies of the foregoing before each member of our delegation in Congress from Kansas.

On motion, the resolutions were unanimously adopted; and the meeting adjourned till 8 P. M.

## EVENING SESSION.

THURSDAY, June 5, 1885.

President Gale in the chair, who announced the welcoming address to be the opening exercise.

## ADDRESS OF WELCOME.

BY GEORGE W. MARTIN, MAYOR OF JUNCTION CITY.

The very pleasant duty devolves upon me of extending a welcome to the Kansas State Horticultural Society. I do this from no vague and indefinite interest in the general subject of Horticulture, but from an acquaintance of twelve years with the operations and discussions of your Society. And while tendering you the hospitality of our people, I confess on my own part to a degree of selfishness, because I believe in the education which comes from contact and association. As a community we have struggled cheerfully and somewhat successfully with the tree problem, and I but echo the judgment of our local Society and of our people generally, when it is said, that the appearance and discussions of such an assemblage cannot but result in increased thought and enthusiasm, and more intelligent practice, among us, in the wonderful field of adornment and profit, which is your specialty. It is in no sordid sense, therefore, that we think it pays to welcome you.

I am a tree man, but not a horticulturist. I mean by this, if you will permit a definition probably not known to your text-books, but found very general in your practice, the larger proportion of every community, who love to plant trees, and who love to see and enjoy them, but without the slightest idea of taking care of them—in other words, those who afford a market for nurserymen. This is not said in any jocular spirit, because I maintain, that there has not been that waste in this direction usually ascribed to lack of intelligence. All cannot be specialists or experts, and the efforts of the most bungling are not to be despised. Nature has a wonderful intelligence. All man has in this field he learns from her. The art and science of horticulture was as fully developed in the Garden of Eden as it is to day. Two very important elements of intelligence are love and constancy. The class of whom I speak are your scholars. They love trees. They are impelled by a single idea, which beats all the nurseryman can say. You know that every time a tree fails, the nurseryman has a new excuse for it. Our class of tree men cheerfully stick to it. This is the only rule of tree planting I know. It may be slower than a more intelligent plan, but for the encouragement of all it may be said, that the "stick-to-it" plan will certainly get there; and then it is less distracting than a raging controversy among those who are not specialists as to how to plant a tree, and specialists you know sometimes bewilder with talk. Our friend Cutter's books will no doubt show how I put \$30 or \$40 worth of trees in the same holes every spring for years. But there was no waste in all this. In those early days we were thoughtlessly engaged in a warfare, now intelligently directed by the Kansas State Horticultural Society, in subduing soils, and in learning the peculiarities of the elements and climate of a new and unknown desert, the outcome of which for years was enveloped in great distrust.

The early settlers of Kansas, mostly gathered from woodlands, found themselves in a treeless region, without previous interest in the general subject of tree culture. Many of them had been raised in regions where the destruction of trees was the first step in opening a farm. I have read somewhere that the generations or individuals compelled to destroy trees are never known to plant them. We all know the discouragements under which the settlement of Kansas began. Many were impelled by strife, as many more by adventure, and the smaller number by a sincere desire to make a home and develop material interests. I would not make light of those who struggled for a political idea. But all this delayed interest in the subject engaging our attention at this time.

Up to the latter years of the sixties, people did not live in Kansas in the same sense they do to-day. They were simply staying. The idea of permanency became fixed after we struck the seventies. I suppose we have followed the regular order in which new countries are made and developed, but if when the first orchard was planted in Douglas county in 1855 the State Horticultural Society had been there, we would to-day be many years further advanced than we are. Not in reputation, for that has been irrevocably established; but in the breadth and quantity of our tree growth. A very modest, and the first exhibition of Kansas fruits, was made at the Illinois State Fair in 1866. Our first great success in the production of fruit, however, was in the year 1869; and at an exhibition in Philadelphia that year, Kansas fruit was pronounced unsurpassed. In 1871 and 1872, at New York, Philadelphia and Richmond, and in a contest with the State of Missouri at Topeka, we triumphed over all difficulties, and reached the stars in the very front of the horticultural ranks. Perhaps the pomological possibilities then demonstrated had much to do with the permanency of our settlement.

I have nothing to say to you on the subject of tree culture. I know but little more now than I ever did about it, beyond the record you have made. I have only to report that love of trees is on the increase in Kansas. I have discovered no new bugs during the past year. But I can speak with some degree of enthusiasm of the history of horticultural efforts in our State. Horticulture is agriculture refined. Diet makes man, and the products of the tree and garden are as distinct and certain in their effects as the difference between races who feed on roast beef and those who subsist on hog and hominy. The agricultural products of Kansas for 1883 were worth over one hundred million dollars, while the products of horticulture footed up less than one million. History shows that the relation of trees and tree culture to agriculture has always been important, and at times vital. The fertility and usefulness of whole countries have been enhanced by the growth of trees, and depreciated or ruined by the destruction of trees. There is no more certain fact in the history of the world than this. Who then can tell the influence of the million-dollar business upon that which produces the hundred million? They are as inseparable as are light and air from the results attained. Twenty-seven years ago I walked through the counties of Johnson and Douglas. It was in March, and added to the dreariness of winter, the desolate blackness following the prairie fire; a shivering wind I feel yet, a night's lodging on the bare boards of the floor, with a dozen strangers, who talked of nothing but fight, blood, and murder, and not enough breakfast the next morning, and it is possible that my idea of the barrenness of the country might be exaggerated. I suppose there were a few scrubby trees in the draws and ravines. How is it to-day? Six hundred thousand fruit trees; two thousand acres of artificial forest; twenty-nine hundred miles of hedge fence, and scores of miles of forest trees lining the streets of towns and villages; and no doubt hundreds of acres of natural forests grown since the prairie fire ceased its biennial ravages, mark the face of those counties. A row of hedge nearly seventeen times around both counties! Is there a soul on earth with language to picture the difference? And is such a wonderful change possible without affecting the elements beneficially toward the bulkier and greater financial interest of agriculture? In the eastern half of Kansas there are over twenty million fruit trees, one hundred and twenty-three thousand acres of artificial forest, fifty thousand miles of hedge, and hundreds of miles of trees in towns and cities.

This is the result of twenty-five years of thought, labor, and stick-to-it, and yet it is only fair to say that the first two-thirds of this time the loss in contending with the elements was enormous. In other words, during the past eight or ten years the progress has been greater and easier than in all the previous time. I am a firm believer in the reclamation of every acre of the Plains to the foot of the mountains, and I believe the tree man to be a vital preliminary agent in effecting such result. In 1850 a ramblor

named Max Greene passed along this valley, and a few years later published a book entitled "The Kansas Region." At the head of the Kansas river he seems to have drawn a line. I quote: "Fort Riley stands near the confluence of the Chetolah and Republican forks of the Kansas river. This district is somewhat inferior, perhaps, in depth and wealth of soil, redundancy of vegetation, to the banks of the lower Kansas, but is preferable for picturesqueness of scene and salubrity of atmosphere." From this point he takes "a cursory glance at the progress of civilization that shall make the 'solitary places glad,'" and bids farewell to "East Kansas" as follows: "From our mental aërie survey the prospect, beautiful and grand—Uncle Sam's premium farm, of two hundred miles square: a succession of vast meadows, surrounded with colossal forest hedges; greenly reposing beneath clement winds, and the overarching sapphire sky with its gorgeous marbling of clouds."

"The clouds

Sweep over with the shadows, and beneath  
The surface rolls and fluctuates to the eye;  
Dark hollows seem to glide along and chase  
The sunny ridges. Breezes of the south!  
Who toss the golden and the flame-like flowers,  
And pass the prairie hawk, that, poised on high,  
Flaps his broad wings, yet moves not—ye have played  
Among the palms of Mexico and vines  
Of Texas, and have crisped the limpid brooks  
That from the fountains of Sonora glide  
Into the calm Pacific—have ye fanned  
A nobler and a lovelier scene than this?"

What kind of a picture would this writer make to-day? With this questioning of nature's rhythmic interpreter, Bryant, he crosses the line into western Kansas, and follows the Chetolah or Smoky Hill to its head, and of this region he uses one sentence of peculiar significance to the topic favored with your attention: "Fruit trees, small crops, vines, and every species of gardening, will succeed better than in East Kansas. The Irish potato only, I am apprehensive, may prove a failure." Hence I have always read with interest of the tree-culture efforts of Hon. Martin Allen, in Ellis county. Time was when Dickinson and Saline, half as far westward as Ellis, were as dreary-looking as Douglas and Johnson on the one side, or Ellis on the other. Ellis to-day has 10,000 fruit trees, Saline 230,000, and Davis, the third smallest county in the State, 150,000. To make these facts more specific, take the town site where we now stand. In 1861, when I first saw it, the twigs—for they could hardly be called trees—growing in Junction City could be counted on your fingers and toes. Along through the 60's only a few believed any success whatever would ever attend tree planting. And yet this spring's statistics show 10,883 fruit trees in Junction City, or three and one-half to every man, woman and child. A careful estimate of the forest trees along the lines of our streets, and in the yards and parks of the town, foots up fully 15,000. It seems incredible that on a mile and a half square, where twenty years ago their growth was doubted, there are to-day 25,000 thrifty trees, hundreds of them being twelve and fifteen inches in diameter. Then the bird, if perchance one strayed to this neighborhood—to repeat a joke as old as the geography representing this region as a desert—was obliged to carry its provender with it while crossing the town site, while to-day the feathered songsters by the hundreds add music to the yards and parks of the town. Less than fifteen years ago it was argued that an apple would not grow in Davis county: last fall those who knew they would grow had the sweet comfort of growing at the lack of market; and I have known peaches to be had for the gathering. Over-production already!

These wonderful results represent a woful lot of trouble and anxiety. My class of tree men have been annoyed only with the annual bill of the nurseryman, or the pestiferous cow which prefers pasturing on young trees, but the scientific and experimental horti-

culturist never sleeps a wink for struggling with bugs and worms. It was my pleasure for several years, succeeding the grasshopper raid of 1874, to "hold copy" with that prince of nomenclaturists and typographers, Edward P. Harris, in the publication of the discussions of this Society, and it seemed to us that the horticulturist who failed to report the discovery of a new bug or worm during the year had made a failure. But the "hateful locust" had a dismal effect on everybody. As the tree slowly recovered, with each intervening year, good cheer gradually came to your aid in battling with the insects, and to-day I rejoice to know that the Kansas horticulturist comes up smiling. And yet with 537 different species of insects, possessed with a love for one particular kind of tree, 396 for another, 299 for still another, on down in like ratio through all kinds of wood growth, until the Kansan is favored with the fact that only sixteen different species worry the cottonwood, several of these miserable little things having in the past damaged orchards and woodlands to the extent of untold millions of dollars, it is not possible for me to assure you that trouble is at an end.

There is recompense, however. There is as much satisfaction in prevailing over a bug as there is in the dollar produced. Success—the accomplishment of something—is the great comfort in this life. I remember the pride with which my mother, about fourteen years ago, sent a box of apples, the product of trees of her own raising in Kansas, to friends in Iowa and Pennsylvania. No price could be placed on those apples which would cause the same joy and delight, shared by the whole family, in showing to skeptical friends something produced from nothing in a region, under suspicion to say the least, at time of settlement. No man need tell me that the wealth he may have accumulated in Kansas is his sole comfort, or in any way compensates for the privations of border life. The creation of a State, its political, social, material, educational, religious, and a hundred other features, growing up under our eyes, is to all a compensation as certain and interesting as the development of plant life. To have assisted in the development of a commonwealth such as Kansas, occurs to but few generations in the history of the world.

If he who makes two blades of grass to grow where but one grew before is a benefactor, who can estimate the service of the one who plants and grows a tree? What is it to grow a tree? Trees have figured to a wonderful extent in the fortunes and comfort of peoples in all ages and parts of the earth. The effects of forests upon rainfall and temperature, and the results of clearing off of woodlands, as said before, are as easily demonstrated from history as that this Society held a meeting last year. Many regions of Asia and southern Europe, once exceedingly fertile and densely populated, because of the destruction of their woodlands are now sterile and desolate. We are told that the country bordering upon the Euphrates, and portions of Turkey, Greece, Egypt, Italy, and Spain, are now incapable of cultivation from this cause. A traveler passing through a province of Tartary in 1826 represented the country as one delicious garden, rich corn fields, fruitful orchards, and an abundance of grapes, melons, etc., interspersed with rivulets, reservoirs and canals—a most lovely picture of industry and happiness. In 1876, just fifty years later, the same region was an arid desert, the rivulets dry, canals empty, and the unrestrained sands of the desert every day gaining upon the land, and the people fleeing, occasioned by all the great forests being cut away. About one hundred years ago, along the southwestern coast of France, many villages and hamlets, and great tracts of fertile land, were buried by drifting sands. A government engineer began the work of planting trees in 1787: the land to-day is reclaimed by a profitable growth of timber, and amidst the pines stands a monument erected to the engineer by the government. These incidents, illustrating the practical value of the presence of trees, may be multiplied indefinitely; but why do so, when we have within our own experience the record and the changed condition of Kansas in the past two decades? At Fort Riley the mean



annual rainfall for the first ten years of measurement, 1854-1863, was 23.41 inches; for the second ten years, 1864-1873, it had risen to 26.46 inches, giving an average increase of 3.05 inches per annum; while the record for the third decade, as far as we have it, shows a continued increase.

"Tis not so much for all the veneration  
That clings to us from dim Arcadian days,  
When nymphs and dryads trod in jubilation  
Our bosky coverts and primeval ways;

Or yet that poets from the ages hoary  
And painters in the latter lapse of time  
Have chronicled each phase of awe or glory,  
And turned our leafy legends into rhyme;

But rather that we find for you the forces  
That draw the early and the latter rain,  
For you hide the fountains, nourish water-courses,  
Which lacking you would suffer loss and pain.

Besides, your children love our deep recesses,  
Your sick revive amid our balm and shade,  
Your sires renew the youth that cheers and blesses,  
Your lovers linger in our every glade."

The life of the tree and the life of man seem to be identical. All through Scripture the tree is used as an emblem of life. "The tree of the field is man's life," and man is "like a tree planted by the waters." The tree was given man for meat, and under the tree we are commanded to rest. And there is one thing from which there is no escape, being just as certain as the material utility of this question, and that is, that the tree of knowledge of good and evil continues with us in the growth or decay of souls.

We are rapidly reaching a time in this country when the cultivation of forest trees will be as much a matter of business as the growth of corn. This branch of horticulture needs crowding. Kansas, however, has greatly increased in forests since the cessation of the prairie fire. My mind reverts back to 1857, and the condition of a certain tract of bottom land with which I am familiar. Then, to all appearance, it was covered with a growth of hazel brush only. To day that same tract is covered with hickory, oak, and walnut trees, thirty feet high; and every winter for some years past, thinning it out has afforded an incredible quantity of fuel and posts. A legacy of vast financial proportions, twenty or twenty-five years hence, would be a quarter-section planted to timber.

To the public generally I desire to say that the State Horticultural Society is one of the most potent factors in the development of the State. Their field of labor and thought involves vastly more than so much per bushel for apples, or the market value of the great variety of the products of the orchard or garden. The tree is a machine as important as the watercourse, the cloud, or the sun's rays, performing services incalculable in addition to the production of fruit. It is to this line of public beneficence and private profit not exclusively their own but of all of us, that the gentlemen and ladies with us devote their attention. Kansas is a wonderful field, and the direction of her horticultural interests is happily in the hands of cultivated, thoughtful, enthusiastic, and conscientious men and women. An increased liberality toward this Society at each session of the State Legislature evinces a growing appreciation; but an investigation of the relations of various foreign governments to the problem of forest culture and the care of woodlands will show that the State is by no means reckless. In many European countries the subject of forestry is intrusted to a branch of the government as important as our Interior Department, and the care of woodlands receives as much attention, if not as much profligacy and fraud, as the river and harbor and government building schemes of development with us. The United States Government has an elaborate Commission, which seems to be giving serious attention to this question. The duties devolving upon these Government agencies are cheerfully rendered the people of Kansas by the State Horticultural Society as a labor of love.

The State Pomological Society was organized in January, 1867, and the present Society was the outgrowth of that in December, 1869. Almost the first words uttered by Mr. William Tanner, as first President, were: "Our duty as pomologists should be to guard and promote the true interests of our people, who will look to us for truth and candor in

all our reports;" "many a hard-earned dollar will be paid for trees which we shall recommend." He urged the preparation of a tree list. That the State Horticultural Society has faithfully followed the line, is certainly demonstrated by the rapidity with which wonderful results have been attained in the past few years—the universal consultation of the voted list by intelligent new-comers in selecting trees—and the prompt and thrifty starting of a new tree to-day as compared with the sickly and fitful struggle with the winds and scorching sun of a transplanted tree back in the sixties. Boards of trade, or organizations devoted to special lines of labor or commerce, may incidentally benefit the public, but it is always at a profit, and never accompanied by a divulgence of all their knowledge and experience; whereas our Horticultural Society, while no doubt reaping reasonable reward for their labors, cordially and cheerfully give to the public the knowledge and experience gained by them, so that others, by simply looking at the record, may do as well.

#### RESPONSE.

The following was made in response, by Lieut. A. Todd, Professor of Military Tactics, State Agricultural College, at Manhattan:

It gives me great pleasure, Mayor Martin, and citizens of Junction City, to thank you, on behalf of the Horticultural Society of the State of Kansas, for your kind welcome. It is a welcome warm and hearty, alike in deed and word, a greeting worthy of the beautiful City of the Two Rivers. We have come to a land of fatness, flowing with milk and honey, and you have given us the best that the market and the season afford. It is true we have not received the "wine which maketh glad the heart of man," but we suppose, Mr. Mayor, that a town which supports so well-known a prohibition paper as the *Union* could not consistently set forth the "flowing bowl."

We have come here to Junction City from all parts of the State to talk about horticulture. We have been talking about it for a good many years, and we intend to continue the talk for many years to come. We have not stopped with talking, for nearly all, if not all of us, have had more or less practical experience in the fruit business. Some are veterans in the cause, who have persevered through years of drouth and discouragement. Others, like your speaker, are recruits, but we all, I think, have grown to love our business, and out of the fullness of our hearts our mouths speak.

You have told us, Mr. Mayor, of your earlier journeyings in Kansas in 1856 and 1857, and of the great advances in horticulture since that time. There have indeed been great changes. Kansas has gone forward in this as in everything else, "with the stride of a giant."

But we think that fruit culture has not yet taken its proper place among Kansas industries. We have our cattle on a thousand hills; wheat-fields wave in billowy swells over almost countless acres; corn-fields push up their myriad tassels to be kissed by the balmy cyclone; and the squeals of 1,500,000 fat hogs pierce the autumnal air. For all these things we are glad; but we would raise fruit growing to an equal place with these other industries.

The question, whether or not fruit can be raised here, has already passed beyond the point of experiment. There was a time—not so very long ago either—when most people said, "Oh, you can't raise fruit in Kansas, and it is of no use try." But the person who says that now is either a "monumental liar" or a stupendous ignoramus. There is no better country in the world for apples, cherries, grapes, and most small fruits; and peaches, plums and pears, although less certain, are produced in moderate quantities. These facts are so well known that further comment is unnecessary.

Neither is it necessary to show that every farmer ought to have an orchard for his own use. This goes without proof. But we maintain as an additional proposition, that many farmers could make it pay, not to raise stock and corn and wheat as a business

and have fruit as an incidental, but to make fruit the main thing and the others incidentals. We are sure for an indefinite number of years to come of a remunerative market, for there is a vast region to the west of us where they do not raise anything except cattle, and "Cain" of the biblical variety. To these regions we can send out apples and grapes and peaches—not many peaches this particular year, to be sure—but then you must remember that I am only dealing in glittering generalities.

The fruit business requires, it is true, a rather large outlay at the start, and does not bring in quick returns. Therefore, a man with small capital must work into the business slowly, reserving a portion of his land for the quicker-paying crops until his orchard shall come into bearing. Then, as the trees begin to yield fruit, more land can be planted to orchards. If a man has plenty of capital, the whole orchard can be planted at the first.

As to the profits of fruit raising, there can be no doubt, we think, that they are equal to, if they do not exceed those of other farm pursuits. An apple orchard of five hundred trees of the right varieties ought to yield fifteen hundred bushels per year when in full bearing. Five hundred trees can be put on ten acres of land, and fifteen hundred bushels of apples will bring from \$800 to \$1,000. Do ten acres of corn or wheat ever bring in so much? But ten acres is a small orchard. There is no reason why many men should not engage in the fruit business to the extent of seventy-five or one hundred acres.

Of course there are drawbacks in this business as in all others. There are insects to fight. Cyclones may uproot the trees, or hail storms may knock off the fruit. These things must be counted upon, and as far as possible provided for. It must not be imagined that fruit will grow itself. The trees must be cared for intelligently, nay, even lovingly. From the time when the little little sapling come from the nursery to the close of its bearing career, there is no time when the supervision of the orchardist can be relaxed. But a great deal of the work in an orchard can be done practically at leisure; it need not be rushed. Pruning, for instance, can be done at any time during a period of several months. Besides, an orchard after it is well grown will take care of the weeds itself, by keeping them under ground.

Fruit culture too is an elevating pursuit. The care of trees and their fruit cannot help but refine and purify us all. The man who can watch the mystic changes from the opening bud through blossom and growing fruit to the gold and crimson splendor of autumn without feeling himself better and happier and nobler, can be touched by nothing short of Omnipotence.

You may think I have flown wide of my subject, which was a reply to the address of welcome, but I have not, for what I have been saying is but to strengthen and emphasize the advice and counsel, which on behalf of the Horticultural Society, I am now about to give.

When you, Mr. Mayor, find the duties of your office growing irksome or unremunerative, when the lawyers tire of making or settling disputes, when the doctors grow weary of the midnight ride, when the merchants have had enough of buying and selling and getting gain, and when the land agent has sold the last of his "finest farms in the county," our advice to one and all of you is, retire to the country, plant your vines and your fig trees, and under their shadows sit ye down and rest.

After the disposition of miscellaneous business, the meeting adjourned to the usual hour on the following morning.

## FORENOON SESSION.

FRIDAY, June 5, 1884.

The Society was called to order by Vice President M. B. Newman; and on motion, a discussion was had on the subject of

## RUSSIAN APPLES.

This subject being next on the programme, J. W. ROBSON opened the discussion, by request. He said that the present experiment of Prof. Budd was by no means a new one. In 1830 the oldest horticultural society in Europe (the Highland Society, of Scotland) obtained an appropriation from the British Government to pay the expenses of a collector to proceed to Russia to procure varieties of apples that would succeed in the Hebrides, Orkney Islands, and other extreme portions of the King's dominion. The collection was placed in the care of Robert Thompson, who, according to our own Downing, was the foremost pomologist of the age. This collection, with the exception of two varieties, was an entire failure.

In 1850, Commissioner Capron received a large shipment of trees and grafts from Russia. These were scattered broadcast over Minnesota, Wisconsin, Iowa, and northern Illinois. All traces of this collection are lost.

During the same decade, E. H. Skinner, of Marengo, Ills., procured a large collection of Russian varieties, and propagated them to a great extent. This horticultural venture was an utter failure, and ruined him financially. With the exception of Alexander, Tetofsky, Duchess of Oldenburg, and Astrachan, the hundreds of other varieties have disappeared.

Now we do not wish to be understood as being opposed to the introduction of fruits and ornamental trees and shrubs from Russia, or other European countries; but we are opposed to heralding their good qualities and fitness for the Western States. A good old sensible book, which lies on our shelf at home, gives the following good advice: "Let not him that girdeth on his harness, boast himself like him that putteth it off." We commend this wise advice to the notice of Prof. Budd.

WM. CUTTER, Junction City: I find no profit in any of the varieties that I grow, except the Duchess of Oldenburg. In answer to a letter from me, Prof. Budd replies: "Where such fine apples of the best American varieties grow and bear such fine specimens as they do in Kansas, don't trouble with the Russian varieties." In a small shipment, which I received from him this spring, labels with numbers were attached to each tree, but no names.

J. W. BYRAM, Cedar Point: The people of our State must be warned to give Russian apples a wide berth. I object to the high rates charged for trees that are not and never were of Russian origin. Members of this Society in every county should use the press to warn their neighbors, and to inform them of the frauds perpetrated upon them by fraudulent tree agents.

L. A. SIMMONS, of Wellington, offered the following resolution:

*Resolved*, That in the opinion of the Kansas State Horticultural Society, none of the Russian apples are worthy of cultivation, except the Duchess of Oldenburg, Red Astrachan, and Tetofsky; and that these, being all summer apples, should only be planted sparingly, for family use, and these may be easily obtained from home nurseries.

The resolution was adopted.

Numbers of the members denounced upland whortleberry, apples on Russian stocks, etc., as frauds.

## REPORT OF COMMITTEE ON PRESIDENT'S SEMI-ANNUAL ADDRESS.

Your committee would beg leave to report, that while they would commend the entire address for the careful consideration of the members of this Society, they especially commend the suggestion of a more perfect system of education, which, advancing beyond the old system (and to a great extent the present), shall give to our students far greater physical powers, and thus strengthen and deepen the intellectual.

We would also ask especial attention to the suggestions in regard to the Exposition to be held at New Orleans, and should this State make a horticultural display, trust that each member of this Society will cheerfully render such assistance as will make it one of the highest credit and honor, both to the State and this Society.

J. W. BYRAM, *Chairman.*

The following paper was then read:

## THE LITTLE WORKERS OF GLENWOOD.

BY PROF. JOHN W. ROBSON, CHEEVER.

Last December, when returning from the Ottawa meeting, we lay over at Junction City, and spent a few days in the pleasant and hospitable home of our genial and intelligent fellow-laborer in the good cause of horticulture—Mr. William Cutter.

Being a keen and watchful observer, he is deeply versed in bird-lore, well informed in regard to their habits; their daily life; their comings and departures, and the benefits they daily confer upon the horticulturist.

As we walked together (in sweet communion with nature) through the entire length of the deep, romantic and lovely glen which surrounds his orchard on the west and north, he little suspected that the "chiel at his side was takin' notes," (penciling down his observations, and random remarks so true to nature,) to be reproduced in a connected form and presented to the members of this Society for their edification.

The morning was warm and clear; not a breeze was stirring; every twig was motionless on the leafless trees; the air so still that not a sound was heard save the chick-a-dee of the Titmouse; the tapping of the Woodpecker; the hammering of the Nuthatch; the sharp trill of the Wren; the unvarying cry of the Creeper; the harsh scream of the Blue-Jay intermingled with sweet tinkling notes; the pleasant songs of the Finches and Buntings; and occasionally the resonant song of the Red-bird.

Toward the middle of the day we ascended the banks of this picturesque ravine, and walked along the outer edges of the fruit trees. During this period we saw a continuous stream of these little workers, flitting from the woodland into the orchard, alighting on every tree, and investigating every trunk, limb, branch, twig and bud, in search of their favorite food.

In this brief paper we design to sketch a few of the prominent genera and species we saw that day, and the day following, pursuing their daily toil. Conspicuous among them were the *Silviadæ* or Wood-birds. The Warblers form a very numerous as well as a very interesting group. Their bills are slender, straight, awl-shaped, and wide at the base. Generally they frequent groves, orchards and woods, and search for the small insects which are their food, among the leaves and twigs, and the crevices in the outer bark of trees.

Diffused over all parts of the habitable world, it seems to be the mission of these little workers to prevent an undue multiplication of the innumerable insects which lurk within the buds, the foliage or the flowers of plants. The diminutive size of these insects causes them to elude the notice of the Thrushes, Robins, and other insectivorous birds, while their habits secure them against capture by the Swallows and other birds that capture their prey only when on the wing.

The Warblers are, for the most part, migratory birds. When the increasing warmth

of spring is ushering the insect tribe into renewed life and activity, the return of these birds is providentially and wisely ordered, to prevent their troublesome and destructive increase.

The Golden-crested Kinglet, the most diminutive of the American Warblers, is an active and restless bird, always found in groups on the extremity of twigs on the tops of the highest trees.

The Blue-bird is a lovely warbler; the favorite of the husbandman and his children; the friend of the forester and the orchardist. It will soon make the orchard its home if small boxes, old tin fruit-cans, or small empty gourds, are fastened to the crotch of the trees.

The Summer Yellow-bird is distinguished for its untiring labors in pursuit of noxious insects, and is remarkable for its instinctive sagacity in getting rid of the eggs of the Cow Bunting. As the egg is too large to be thrust out, this Yellow-bird commences a new nest above it, and then proceeds to deposit its own eggs.

The Black-cap Titmouse searches assiduously for insects among shoots and tender buds of trees. Even in winter he endures the biting cold, and forages in the orchard for his daily food, which consists of the eggs and larvæ of our pestilent foes. A little inducement extended will encourage this little snow king to frequent our homes. Any kind of fatty offal hung on the branches of the apple trees will bring them in troops, making our surroundings more pleasant with their merry chatter and rapid song. The addition of a long, narrow calabash stuck in the trees will encourage this faithful little worker to remain all winter.

#### CERTHIADÆ—CREEPERS.

The Nuthatch is allied to the Titmouse on the one hand, and the small Woodpeckers on the other. Their bill is straight and strong and pointed, but is used rather to scale off the bark than to perforate it. They run about the trunk and branches of trees, head downward, seeking for insects and their larvæ, berries, and nuts. They are usually fond of pumpkin seeds. These, strewn at the base of apple trees or stuck in the crotches, will induce these industrious workers to frequent the orchard.

The Brown Creeper is an extremely active and restless little bird. In winter it associates with the small spotted Woodpecker, Nuthatch and Titmouse, following in the rear of their explorations, gleaning upon those insects which they have alarmed or exposed. The voice of the Creeper is a monotonous cry, not very loud, but often and suddenly repeated, especially in its flight from tree to tree. It is strictly insectivorous.

The House Wren is a familiar little bird in country and town. Its life has become inviolable even to the bird destroyer. The confidence which it shows in courting the neighborhood and companionship of man insures it perfect immunity from man. Dressed in its trim Quaker garb, it makes itself at home on the walls of the country cottage or the more pretentious city residence, feeling safe in the protection afforded. It prefers to build its nest in boxes or miniature houses prepared by its admirers. It seldom builds a distinct nest, but mostly conceals it in things placed for its convenience. When it builds in a hole in a tree, it fixes pieces of loose bark on the outside of the nest to avoid detection. The nest is very large and neatly built. Audubon figures one beautifully, as built in an old hat; and Wilson figures a neat circular nest of moss, surrounded by the tropical foliage and superb blossoms of the trumpet flower. The House Wren shows great antipathy to cats. In their presence it frets and fumes. Although it does not attack puss, it follows and scolds her until she is out of sight.

#### FRINGILLIDÆ—FINCHES.

The Finches are a very large and interesting family, and the majority of them are excellent and pleasing songsters, diligent workers, spending the day in busy explorations after insect food. These little birds frequent fields, groves, and woodlands; members of

the various genera are found in gardens and orchards, building their nests in lowly bushes and lofty trees. So numerous are the genera and species of this invaluable family, that we could not name and describe them. We will confine our descriptions to some of the most prominent that we know.

The Chipping Sparrow is not very musical, but it sings none the less for a' that. This bird may be noticed gleaning up the crumbs in our dooryards—it will even approach the threshold to pick up the crumbs thrown to it. In this social characteristic it is singular. It is very destructive to the hordes of caterpillars and bugs which destroy the foliage of our trees and small fruits.

The Indigo Bird is very small and beautiful. It is purely insectivorous, and diligently spends the summer in the pursuit of its favorite food.

The Song Sparrow is the harbinger of spring. It is the earliest, sweetest, and most lasting songster. It feeds chiefly upon insects.

The Ground Sparrow builds its nest in a tuft of grass, scooping out the earth at the base of the tuft. It lives on grubs, earth and wire worms, and other terrestrial insects.

The Tree Sparrow is unwearied in its labors as an insect destroyer. It can be found in large numbers among the magnificent elms which line the shores of the Republican river. He is a lively little fellow, causing the timber-lands to resound with his sweet songs.

The Crested Red-bird is full of agitation and movement: as it flits from tree to tree it is an object which no one can see without admiring. In richness of plumage, elegance of motion, and strength of song, this species surpasses all its kindred found within the United States. It feeds on grain and insects.

Horticulturists as a class ought to be so deeply interested in the birds as to become their guardians, and to enforce all laws for their preservation and protection, for they are our friends, fellow-citizens of our farms and orchards.

I fancy I hear a voice saying, "You always dwell upon the bird's uses and beauties, but not upon his defects and vices." This we certainly would do if it can be clearly proven that they have more vices than virtues.

"You slay them! and wherefore?—for the gain  
Of a scant handful more or less of wheat."

"When we plant our fruit trees, our berry bushes, and our strawberry beds, plant a few extra ones for the birds. Lowell says: 'For 'a that and twice as muckle as that, I would not exchange the Robin for all the cherries that ever came out of Asia Minor.' Let us educate our children to protect, study and love the birds; teach them that to kill a bird with a sling-shot or in sport is a sin. Let the farmer when guiding the plow; the farmer's son while driving the cattle to pasture or meadow; the mother and children while working among the flowers, fruits, and vegetables, or when abroad in the cool of the evening, listen to the voice of the birds, and before the summer is over I assure you new life-long friends will be yours, that will be well worth knowing."\*

We earnestly hope that this Society will still continue to insist upon having the natural sciences taught in our common schools. The children in primary classes should be so taught that they would have an intimate acquaintance with the animals of the forest and prairie, the beautiful birds of the air, and the flowers of the field and the meadow; and when they turn the soil of dear Mother Earth, to be able to tell at a glance of what constituents it is composed, and be able to tell whether the rocks dug out of it were formed by the action of fire or water. This would be giving the children of this grand State a glorious education, good for all countries, all times, and all seasons.

We have been ever grateful that our first and only schoolmaster had not only a

\* Mrs. Lewis, Madison, Wisconsin.

knowledge of, but had a pure love for, natural history. It was he who filled our young minds with a love of the beautiful, taught us how plants grew, fed, and moved; took us with stealthy and wary steps to spots where the wild bird built her nest; instructed us in the names and habits of his favorites; and led our young footsteps along the streams and meadows, over the hills, and through the shady glen. We are confident that this knowledge, so tenderly and patiently imparted by that teacher of our childhood days, has made our life purer, sweeter, and better, and the world, we trust, as well as ourselves, has been the gainer. To us it has opened up an ever new, fresh fountain of life. Nature has been ever near since then, whispering her secrets and her mysteries, that are so old, yet ever new.

After the reading of this paper, Dr. Reynolds moved the following resolution:

*Resolved*, That Prof. J. W. Robson is hereby requested to prepare a paper on the ornithological and entomological friends and enemies of the horticulturists of Kansas, and present the same to the next annual meeting of this Society.

Adopted.

#### FINAL RESOLUTIONS.

*Resolved*, That we, the members of this Society, do hereby express our earnest thanks to the members of the Davis County Horticultural Society, and the citizens of Junction City, for their kind and hearty reception and most generous hospitality extended to us during this, our semi-annual meeting: and further, do we express hearty thanks to those who have aided by their efforts to enliven the exercises of the evening sessions with entertainments of both vocal and instrumental music.

Respectfully submitted.

H. E. VAN DEMAN, *Chairman*.

On motion, the report was unanimously adopted, when the meeting adjourned *sine die*.



PROCEEDINGS  
OF THE  
EIGHTEENTH ANNUAL MEETING,  
HELD AT  
BURLINGAME, OSAGE COUNTY, KAS.,  
TUESDAY, WEDNESDAY, AND THURSDAY, DEC. 16, 17, AND 18, 1884.

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The eighteenth annual meeting of the Society was held at the city of Burlingame, on a cordial invitation of the Burlingame Horticultural Society, and opened its sessions in the Baptist church, at 10 o'clock A. M.

President Gale being absent, the Vice President, M. B. Newman, called the meeting to order, and made appropriate opening remarks.

Prayer was offered by Rev. Levi Morse, of the city.

The President announced the following committees:

*On Credentials*—E. P. Diehl, L. A. Simmons, H. Dubois.

*On Obituary*—L. A. Simmons, D. Doyle, S. M. McCullough.

PROGRESS AND CONDITION OF HORTICULTURE IN THE STATE DURING  
THE YEAR.

On motion, the above-named subject was discussed as follows:

H. DUBOIS, Burlingame: The progress in this (Osage) county has been commendable, and the industry is most advanced in the southern portions. Many orchards are in profitable bearing. Apples and peaches have been abundantly produced. Small fruits are grown in limited quantity.

D. DOYLE, Oswego, Labette county: There are many large apple orchards which are in fine and healthy condition in my county, and are in bearing. Many persons are devoting their entire farms and time to fruit-growing, which enables them annually to make large shipments. We have one pear orchard which contains five thousand trees, in which blight has not appeared. In fact, this disease has not been prevalent in the county. The progress and success of the industry is largely due to the work of our active County Horticultural Society, and the enthusiasm excited among its members.

E. P. DIEHL, Olathe, Johnson county: Orchards in the county are in a fine condition. Some varieties of apples prematurely cast a portion of their fruit the past season. These were the Baldwin, King of Tompkins, Winesap, and Dominie. Trees of the Smith's Cider were injured by blight. Pear trees suffered less from this disease than in years before. Strawberry plantations yielded abundantly; blackberry, light; raspberry, fair crop. The pursuit of fruit-growing is now admitted to be more profitable than that of agriculture. The County Horticultural Society was organized eight years ago, and is doing much good through the practical knowledge which it collects and disseminates. Injurious insects and fungi are increasing; the damage done by these agencies in a single season has not been less than 60 per cent.

L. A. SIMMONS, Wellington, Sumner county: Thirteen years ago the first settlement was made in the county. This industry has rapidly advanced, and the past season a handsome product was realized from it. Insects are not prevalent—mostly borers, which have been prevented from doing much injury by washing the bodies of trees with carbolic acid reduced with water, and strong soap-suds. My pet remedy is to grow onions near the trees, the tops of which fall onto the ground and answer the double purpose of a mulch and shade and as a preventive of insect attacks. Pear trees are not attacked with blight in the county, and such trees as fruited the past season yielded a fine product. The cherry crop was heavy, of the Early Richmond and English Morello varieties; the sweet varieties do not succeed. Budded varieties of peach trees bore a heavy crop; seedlings were not profitable. Plum trees, especially the Wild Goose, were productive. One six-year-old tree yielded eight bushels this season. The Miner is two to three weeks later in season, and fruited for the first time. Small fruits have not been extensively grown in the county, but are profitable wherever tried. Red varieties of raspberries fail; the blackcap varieties—McCormick, Davison's Thornless, and Gregg—succeed. The encouraging results of the early plantings will stimulate extensive investments in fruit-growing another year. Our County Horticultural Society has had a struggle for existence, but it *will* pull through.

S. McCULLOUGH, Grand View, Morris county: In my county orchards are largely confined to the river bottoms, and are a success; uplands will be made successful in time. Trees made a very fine growth during the past three years. Small fruits are being made profitable. Insects are not yet prevalent.

F. WELLHOUSE, Fairmount, Leavenworth county: Orchards are in a fine condition throughout the county—those which have been planted on well-drained land. In such locations the fruit buds are well formed. The apple crop for 1884 was variable in quantity and quality. In some locations it was fine; in others it was damaged by hail. The subsoil in the county is composed largely of an adhesive clay. We have a large apple orchard in Miami county. From that was realized a very fine product this season. Soil is upland underlaid with a stratum of limestone near the surface, which is broken by frequent seams, and these afford ample sub-drainage. I am not acquainted with any orchards on bottom lands.

#### LOCATIONS DISCUSSED.

D. DOYLE, Oswego: Orchards on bottom lands yield the heaviest crops and the finest quality. Uplands, when manured, do nearly as well.

L. A. SIMMONS, Wellington: Bottom lands produce the largest and finest-appearing fruit, but the uplands the best flavor.

E. P. DIEHL, Olathe: Upland-planted orchards are most successful in Johnson county. Varieties of apples which are shy bearers have been made productive by a system of root-pruning.

F. WELLHOUSE, Fairmount: The Yellow Bellflower, heretofore a sparse bearer, has yielded a fine crop this season. I have been inclined to judge the cause of failure of this variety to be a too dry climate. As 1884 has been a wet season, does not the result support my theory?

H. DUBOIS, Burlingame: Results as to bottom or uplands seem to be about equal, and there are no serious objections to planting on bottom land; but some of the finest orchards are located on uplands. I have tried to produce fruitfulness in the Yellow Bellflower by root-pruning, but failed.

H. WARD, Burlingame: My observations have caused me to favor low lands or sloping bottom lands, such as lie below the limestone ledges, as I have found the product of such locations larger and of better quality.

R. T. BLACK, Burlingame: I must concur with Mr. Ward in favor of low lands.

M. ALLEN, Hays City: Horticultural efforts are prospering fairly in Ellis county. The crop of fruit has not been as large in 1884 as during some of the preceding years, but of good quality. Some injury occurred from hail storms, and some varieties suffered from rains, while others were improved.

WM. CUTTER, Junction City, Davis county: The condition of bearing orchards at this time is good. Young trees, not in bearing, made a late growth, and may suffer from intense cold, because of the wood not being well matured. The apple crop was equal in extent to that in 1883, but winter varieties are not keeping as well as usual—the weather having been too warm. Small-fruit crop was materially injured by a late spring frost. Apple and peach-tree borers are being rapidly exterminated by the woodpeckers. Every fruit grower should use means to protect such birds from destruction.

N. P. DEMING, Lawrence: A snow storm occurring at the time of blooming injured the productiveness of orchards which were located on the uplands in Douglas county.

A. ALLEN, Wabaunsee: Two years ago the apple crop failed in orchards on uplands, from frost, while it was a success on the bottom lands, as frost did not occur in such localities.

WM. CUTTER, Junction City: Sometimes such an occurrence will happen when cold currents of air pass over the uplands but do not descend to the lowlands.

Adjourned to 1:30 P. M.

## AFTERNOON SESSION.

TUESDAY, December 16, 1884.

Vice President Newman in the chair, who announced as the first exercise the following paper:

### WHAT ARE WE HERE FOR?

BY L. A. SIMMONS, WELLINGTON.

This pertinent inquiry—or conundrum, as it may perhaps be more properly termed—is not of my own choosing: attribute it, if you please, to the fertile brain of our excellent and ingenious Secretary. By the term “we,” he undoubtedly means the members of this Society; and so the question may be answered by each individually, or by the Society as a whole if all are agreed as to the motive in assembling. I presume that each one of us could give a reason for his convening at this time and place. I will warrant the Secretary knows what induced him to leave his cozy quarters in the “sunny South,” to expose himself to the chilling blasts and nipping frosts of the Kansas winter, and would be half, if not wholly, offended if any one should term it “a fool’s errand.” He might, if interrogated, in brief tell you that he came to assist in carrying forward the purposes for which this Society was organized; while if I were to answer for myself personally, I would say as a young member of the Society (young in the Society, I mean), I came to learn—to increase my knowledge of horticulture.

So I might proceed to guess, with perhaps a jot of native Yankee shrewdness, the answer each member, from our revered President down to the last who has been enrolled, would give if specially interrogated; and from the widely-differing replies I might try to sift the actual answer of the Society.

Taking the above supposed answer of our worthy Secretary as the probably correct answer of the Society as a whole, I ask all to consider fairly what it involves. Our charter states that this Society was organized “to promote horticultural and pomological science in the State of Kansas.” Has this Society at all its sessions since its organization been strictly and seriously engaged in the promotion of said sciences? If yes, and sci-

ence is correctly defined as "knowledge eliminated by the classification of facts," what horticultural facts has it in these several years of labor definitely ascertained? How has it classified them? What special knowledge has it secured and promulgated in the State? Let us look into the several volumes of our reports for an answer.

Recurring to the earlier reports, we find each contains a few instructive essays and reports of standing committees, interspersed with discussions in which are detailed the experiments of the members, or a brief recital of their experience. By these discussions many important facts, the results of the actual experience of practical orchardists and small-fruit growers, were certainly established; and in the essays and committee reports of succeeding years, we find many of the facts which had previously been brought to the cognizance of the Society, arranged or classified, and from them sterling conclusions drawn, invaluable horticultural knowledge enunciated.

For years the members frequently misunderstood each other as to the varieties of apples and peaches, owing to the local names given them; and by establishing the standard names of each, our Committee on Nomenclature has to a great extent banished the confusion and perplexity which formerly existed. This work is still incomplete, for valuable varieties are being constantly introduced from other States, and new seedlings brought forward for examination and a name.

Our Committee on Botany and Vegetable Physiology has in each report shown remarkable depth and extent of research and careful scrutiny; and in the varied and eminently practical teachings of our profoundly scientific friend, Prof. Robson, we have found many promptings to thorough investigation, many a definite statement of established scientific facts and principles, directly applicable to our avocation, constantly serviceable as we labor in field or garden, and incalculably useful in the art (which is but the applied science) of horticulture.

Our Committee on Entomology has given us several papers of almost inestimable value, as they are replete with positive facts, and detail the results of many successful as well as unsuccessful experiments in dealing with the friends and foes of both orchard and garden. But the reports from this committee, supplemented as they have been largely by the able and instructive papers composed and compiled by our zealous and persevering Secretary, have not as yet, in my humble opinion, presented this *momentous subject* in all its phases, relations and bearings, as fully and definitely as the highest interests of our Society actually—yea, imperatively—demand.

To our Committee on Forestry, were I able, most cordially would I pay the high tribute which their extensive and arduous labors so richly deserve. It has been their task to gather facts over a very broad territory of greatly-diversified soils, subjected to remarkable vicissitudes of climate; to experiment in a vastly new and untried field, the plains of the central portion and especially of the western half of the State; and to deduce conclusions from the varied and oftentimes bitter experience of the settlers, each of whom as a general thing commenced work strongly inclined to follow his own preconceived whims and notions, regardless of peculiarities of soil and climate, rather than the advice of pioneers. Assiduously, ably and zealously have our committee done their work, receiving efficient assistance from many successful forest-tree planters throughout the State, until the Fourth Report of the Forestry Department of this Society (State Horticultural Reports, vol. XIII, pp. 114-165) is freely accepted as reliable authority on timber and grove planting in the counties where it is most extensively distributed.

Our Committees on Small Fruits, Vine Culture, and Handling Fruits, have from time to time given us many valuable facts, many momentous suggestions; and as a general rule their reports show careful investigation, close discrimination, and a creditable zeal in endeavoring to place before this Society all the matters of paramount interest connected with their several fields of observation and study.

From our Committee on Vegetable Gardening we have in past years had some excellent reports, showing at least the results of judicious experiments, giving sagacious instructions as to the details of garden work, and an excellent list of the varieties of "garden truck" found best adapted to our soil and climate. Yet our Society failed to adopt or disapprove of the proposed list of varieties during the past year.

So much for the reports of our standing committees, which in the earlier years of our Society were almost invariably followed by an *extempore* discussion, wherein the views of the several members upon the leading points made in the report were freely expressed, and many a matter of experience was made known from which an emphatic lesson was learned by the members present. But of late the discussions have been very brief, when not entirely omitted. Understand me, I do not underrate the importance of the reports of each of the standing committees. They are indispensable; they are entertaining to ourselves and the public; they contain a vast amount of really useful information, and when made strictly applicable to our favorite science, afford vital instruction, positively useful knowledge to all practical horticulturists.

As to our general discussions, none should be allowed except upon a motion or resolution having an affirmative declaration; and after their discussion let a vote be taken, that the Society may declare its position upon the subject, and be placed upon record. A society composed of able and experienced members as this, should be prepared by this time to decide by positive vote many of the important questions which have engaged the attention of horticulturists in our State, and which men of recent settlement are ignorant of.

Again, it is time that the Society take its place on a higher plane of horticulture, and consider those subjects which pertain to advanced horticulture. We have passed out of the alphabet, I hope, and are ready to meet some of the vitally important questions which confront us, in the perpetuity of our industry and the usefulness of our work. You may ask, Have you a plan to suggest? I answer, Yes. Let the teachings of this Society be put in a concise and conclusive shape, so that the novice, upon entering this pursuit, will not be compelled to search the reports, from its first publication to its last, to obtain the information requisite to success. As the apple orchard, more than anything else, engrosses our attention, let us begin with that as our subject, and if we succeed apply the scheme further. Let us have a Manual of the Apple Orchard prepared by the Committee on Orchard Culture, or a special committee. This Manual, we will say, should contain nine or more chapters, to wit: Chapter I, on Selection of Site; Chapter II, on Preparation of the Soil for Planting; Chapter III, on the Selection of Varieties; Chapter IV, on Planting; Chapter V, on Cultivation before and after it comes into bearing; Chapter VI, on the Enemies of the Trees; Chapter VII, on the Enemies of the Fruit; Chapter VIII, on Gathering and Handling of the Fruit; Chapter IX, on Preserving and Marketing the Fruit. Each chapter should be divided into sections, so that each may present a definite point for consideration and ready reference. For instance: Chapter I, on the Site.—Section 1, position as to dwelling, out-buildings, garden, etc.; section 2, with regard to slope or inclination; section 3, as to the quality of the soil. Or take Chapter IV, on Planting the Orchard.—Section 1, on laying off the ground and distance between trees; section 2, time of planting (spring or fall); section 3, on the method of planting; section 4, on pruning at the time of planting; and so on with each chapter.

Thus, as soon as the Manual is prepared, let it be brought before the Society for adoption. It can be taken up section by section, and adopted as written, or amend to meet the views of a majority of the Society; and when the whole is finally adopted, let us have it published as by the authority and under the sanction of the Society.

Such a work will immediately become a "Handbook and Guide" to all who have

orchards, as well as to the vast multitude who are annually thronging into our highly-favored State, shortly to become orchard-planters. By this course our Society will make a record, will establish its position in respect to one branch of our beloved science, our favorite art. As the whole mass of our people gain confidence in our Manual, our influence as a society will increase in an ever-accelerating ratio. If in future years any section of our Manual is found to be defective, it can be amended at any regular meeting. If new sections are required, they can from time to time be added. As the statutes of our State are section by section amended by successive legislatures, so may our Manual be amended and corrected by this Society at its regular or annual meetings.

Then, when we have completely disposed of one subject, let us take up another, handle it in the same way, or a better one if possible; then another, and so on until we have a complete Manual of Kansas Horticulture, subject, of course, to amendment and revision as our successors shall deem necessary or expedient.

By this system, this plan of work, I firmly believe we shall take position in an advanced class; shall put aside all pointless discussions; shall establish, at least for our day and generation, the cardinal principles of horticultural science; and as our Manual becomes authority, we will more surely and rapidly promote the objects for which our Society was organized, and in so doing promote the intellectual, social and moral welfare of our people.

I leave this subject for your thoughtful, candid and generous consideration, and will say in conclusion that I believe we should realize that a definite aim, plan and purpose is essential to the achievement of our great undertaking.

Finally, as we are here to labor for the promotion of our delightful and ennobling science, and its correlative art, in the language of our honored President: "We would press into the service everything that makes home brighter and better; flowers, shrubs, and trees, for the window, garden, and park; vegetables and fruits for every season of the year; homes with every possible attraction which the purest love and the highest cultivated taste can give to all their surroundings; a people delighting in all that is good, cherishing the beautiful things of God; a people rejoicing in social intercourse, making the world brighter and better, and though differing often in faith, yet bowing reverently to God, the author of all good. Such we gratefully accept as the end and aim of our work."

E. P. DIEHL, Olathe: I consider the matter presented by the essayist important, and the suggestions worthy of our attention. Therefore I move that a committee of three be appointed to take charge of the paper, and report thereon at this meeting.

The President appointed E. P. Diehl, Prof. E. A. Popenoe, and J. G. Clark.

#### ORCHARD CULTURE.

ABNER ALLEN, the standing committee, stated that he had not prepared any report, but had a few suggestions to make, viz.: Horticulturists generally conceded the great advantage of a continuous cultivation of orchards until the trees reached a bearing age, and then seeding the land to clover. Would ask why advise seeding at an age when the trees need stimulation, as they have just begun on the most exhausting period of their existence, viz., growing and maturing their fruit.

The following report was then read:

#### SMALL FRUITS.

BY JUDSON WILLIAMS, OTTAWA.

I am not unconscious of the honor conferred on me in the preferment to fill the chair of the Committee on Small Fruits. Possibly my known love for and enthusiasm in this branch of horticulture have been the cause of my selection. I shall not deny being the

possessor of these essential qualifications to success in this line, and will now lay down the proposition, that is as true in horticulture as in any other vocation, viz.: That none but enthusiasts become preëminent in any line of pursuit; and conversely, such are generally successful in whatever they undertake. And I will say to persons who are about embarking in small-fruit culture, first of all, cultivate an enthusiastic love for your new undertaking—not alone for strawberries and cream merely, but the whole matter, that the hard work inseparably connected with it may not be looked upon as menial drudgery. Without this love, the failures which may occur to your efforts may drive you out of the calling. Read the writings of intelligent men on the subject, and don't fear to be called a "book horticulturist." By all means unite with some live horticultural society, and when you have gleaned any important information from experience, relating to your work, give others the benefit of it. Little honor accrues to a man who hoards his knowledge from others through fear that some one may become a competitor. There are those here to-day who are veterans in this pursuit, and whom I would not presume to advise. To such I will simply say that the outlook is good, and the demand for this fruit is greater than the supply. From a rough estimate, Ottawa city, containing a population of about 7,000, paid about \$7,000 for strawberries alone in 1884. These were not all consumed in the city, but many went into the country, as it is almost proverbial that the Saturday market was not glutted. Think of the many who own broad acres of rich land, and yet only indulge in such a luxury two or three times during a season. Have we not a missionary work to do?

#### PREPARATION OF LAND.

I think it is generally admitted that spring-time is the best for planting strawberries. This being settled, I would say, never fail to plow land for such purpose late in the fall or in winter; by so doing the white grub is turned to the surface, or near it, and either are killed by severe cold weather or are picked up by skunks, crows, plovers, and other insectivorous species. But there is another advantage: land plowed in autumn needs no harrowing, as the frost of winter generally thoroughly mellows it, and it needs no other attention than leveling down with a board drag just before planting in spring. Such a treatment affords the best preparation of lands used for small fruits.

#### PLANTING.

The best method I have yet found for marking the land for rows in planting, is as follows: Attach two buggy wheels to an axle so that they will track four feet apart, or the desired distance for planting; nail a lath midway between them. Then set a straight line of stakes, each four feet long—laths are suitable—on the land where the first row is to be planted, which gives a line to guide the running of the wheels, which should be pushed over the land, keeping the lath on the axle in range with the row of stakes. As the wheels pass over each stake, set in once-and-a-half its length into the unmarked land, to mark the next row by. By this method two rows are marked at once which may be plainly seen, even after a heavy rain. A clean spade is the only implement needed to set the plants with. A smart boy to carry the plants, and a lively hand with spade, can set twenty-five hundred plants in a day, with only two or three per cent. loss in favorable weather.

The needed implements for cultivation are a five-tooth adjustable cultivator and bright steel hoes, both of which should be used faithfully until the weed growth is checked by autumn frosts. I will mention one other implement which can be used to an advantage during seasons which produce a heavy amount of runners required to be cut off, viz., a common rolling plow coulter, attached to a piece of timber about five feet long, and which can be made to serve as a handle also. This can be run each side of a row of plants, cutting off all the runners which have grown outside of the row, leaving the breadth desired for the matted-row system. Follow this with a cultivator, which will

tear up all the plants cut off. For large plantations, two of these coulter may be attached to an axle and drawn by a horse, cutting two rows at each round. Plant growth the past season has been almost phenomenal, and I am confident that such rampant growers as the Crescent would give better results the next year had they been treated to such a cutting.

#### MULCHING.

There appears to be an understanding in the minds of some planters that the object of a mulch is to prevent plants from freezing, which has induced some to use more material than is necessary. Perhaps the most important advantage of a mulch is to prevent the soil and plants from a too rapid thawing and exposure to the direct rays of the sun when frozen, which frequently occurring causes an injury; also to retain moisture in the ground, prevent early blooming, which would be liable to injury from late spring frosts, and to keep the berries from the ground. If, however, the grower is willing to take such risks by raking back the mulch from off the rows of his earlier fruiting kinds, such will ripen their fruit several days in advance of those not so treated. Prairie hay, clear of weed seed, is the most available as well as suitable for mulching in Kansas.

#### VARIETIES OF STRAWBERRIES.

It is safe to plant largely of the Crescent, fertilized with Chas. Downing, Miner's Great Prolific, Bidwell, or James Vick. Crystal City is the earliest variety I have; is not prolific, and plant subject to blight. I find none preferable to the Glendale, for a late sort. Of the newly-offered varieties I will say but little, as few persons can afford the expensive cost of \$5 per dozen, and the risks of their absolute worthlessness in our climate. I would suggest that it is far better to invest one-half the amount in common flower pots, fill each with rich vegetable mold and sand, and during the ripening season select from the variety desired to be propagated the largest and fully-matured berries, squeeze their seeds into the pots, cover lightly, keep well watered, and in a warm, partially-protected place, and soon you will have a nursery of young plants, some of which may rival in some valuable qualities even the best now in cultivation. Is it not a foolish policy to send thousands of dollars annually to the far-off East for the highly-extolled new varieties, while we possess soil and every facility so favorable to originate new varieties at home?

#### INSECT ENEMIES OF THE STRAWBERRY.

Before leaving this berry, I would mention some of the insects which the grower of this fruit will sooner or later have to contend with. The most formidable are: Crown borer, white grub, green strawberry worm, and leaf-roller. The first may be controlled by plowing under all the plants of the infested beds as soon as practicable after the crop is gathered; white grub, by fall plowing, which exposes the grub to destruction of natural enemies; the others, being defoliators, can be subdued by a spraying process, using London purple, arsenicum compounds, or kerosene oil properly mixed with water.

#### RASPBERRIES.

Of this fruit I would say as of the strawberry—they are not difficult to grow. Of the red varieties I would state one fact, that their disposition to form numerous young plants must be checked, as it is at the expense of a crop of fruit. The double object of growing plants and fruit at the same time, and with the same plants, will not yield much profit in the product of fruit. Such a practice may to some extent succeed with the blackcap sorts.

**RED VARIETIES.**—The Reliance, Cuthbert, New Prolific, and Crimson Beauty are the only ones that have given me any degree of satisfaction.

**BLACKCAPS**—Perhaps the Souhegan and Hopkins are the best early, and McCormick and Gregg, best late sorts.



## BLACKBERRIES.

Reports from the west and northwest seem to indicate that the Snyder is taking the place of nearly all other varieties, which is probably owing to the hardness of its plant. Besides this it has but little in its favor, as compared with the Kittatinny, which still holds its own against rust and the damage of severe winters in the southeastern part of the State. A cross of this noble berry with the Snyder, or some other hardy sort, might give us a more valuable berry than we now have. So long as this fruit commands fifteen to twenty cents per quart in our markets, the originating of new varieties will be strongly stimulated.

I am now turning my efforts to the culture of a new variety, named the "Holey," which has been found growing for many years past along the prairie ravines in Franklin county, producing annually a berry of medium size, but of excellent quality. It was first put under culture by Mr. E. Holey, and from that fact it received the name.

Blackberry plantations should be renewed every five or six years.

## CURRANTS.

The past season was one very-favorable to the growth of this fruit, and the heavy fruiting of nearly all varieties and in all locations was an unprecedented success, which may mislead such persons as are inexperienced in its culture. I am quite confident that any attempt to grow it with such treatment as it receives further north and east, will result in a sad failure sooner or later, and which will do much to discourage the planter.

I do not see any reason why it may not be profitably grown in a large portion of the State. In Franklin county it is being grown between rows of Juneberries, which provide necessary shade, and will not rob it of the moisture. The common Red Dutch is probably as good as any sort tested in the State.

## GOOSEBERRIES.

Of this berry the Houghton is mostly used, and is about the only variety which has proven profitable. Others have been tried, but found non-productive, hence discarded.

## CONCLUDING REMARKS.

In looking over the past year, small-fruit growers must feel that it has been favorable to both product and plant growth; that the future of this branch of horticulture is now very promising in the vigorous, healthy-looking plantations.

## DISCUSSION ON SMALL FRUITS.

L. A. SIMMONS, Wellington: Is mulching necessary?

JUDSON WILLIAMS, Ottawa: I do not think a strawberry plant has ever been killed by freezing; they may have been drawn out of the ground by the heaving of frost. The main object of mulching is to secure clean fruit by forming a resting-place for the berry and to prevent dirt from being spattered onto it by every rain.

J. G. CLARK, Waveland: I have used straw mulching, and think that plants have been injured by smothering. I prefer to simply shade the plants with brush or corn-stalks bound down by long poles.

J. W. WILLIAMS, Cope: I have used mulching, and am fully convinced of its advantage. It keeps the fruit out of dirt, and the ground cool and moist, which are important conditions in the culture of this berry. In the spring, open the mulching from immediately over the plants, to permit the growth to shoot up. Without a mulch the berries will be ruined by dirt and rains.

JUDSON WILLIAMS, Ottawa: By removing mulching from plants you can secure an early bloom and an early-ripened product.

PROF. E. A. POPEOE, Agricultural College: Mulching is a necessary protection against the evil of drying effects of winds, common some seasons.

Discussion closed, and meeting adjourned to 7 o'clock P. M.

## EVENING SESSION.

TUESDAY, December 16, 1884.

Vice President Newman in the chair. The exercises opened with music; after which the following paper was announced and read:

## AN ACCOUNT OF AN INSECT INJURIOUS TO THE RED CEDAR.

BY PROF. E. A. POPEÑO, AGRICULTURAL COLLEGE.

During the summer past my attention has been called by several persons in the western part of the State to the depredations of some unrecognized insect upon the red cedar — *par excellence* the evergreen for Kansas planting. A single specimen of the insect was sent me by Mr. F. H. Barnhart, the editor of the *Osborne County Farmer*, but being inclosed loose in the letter it reached me so thoroughly broken and flattened as to be unrecognizable. It being then past its season, further specimens for identification could not be found by Mr. Barnhart. A month later I learned of Mr. Warren Knaus, of Salina, that the same injuries had been observed in his locality, and he had been fortunate in securing specimens, which he had submitted to Mr. Henry Ulke, of Washington, D. C., a well-known coleopterist. The species was by Mr. Ulke recognized as the *Phæosinus dentatus*, of Say, of the family *Scolytidae*. The insect then is allied to a great number of bark-boring beetles attacking coniferous trees in the Northern and Eastern States.

Thinking that any information regarding this insect would be of interest to the State Horticultural Society, I requested Mr. Knaus to furnish a copy of his notes upon the insect, which he has kindly prepared, and which I copy herewith:

"About the middle of October, Mr. T. L. Bond reported to me that a small insect had been working on and seriously damaging the cedars in his grounds. I obtained from the trees infested four or five specimens of the insect, which, on being identified, proved to be the Juniper Bark Borer, *Phæosinus dentatus*, Say, an abridged description of which is given below. At the time the examination of the trees was made, but few beetles were found, the season being then almost closed.

"Mr. Bond informed me that he first noticed their attacks in August, when some of the smaller branches began to die. During August and September they were very numerous, and, by carefully looking over the trees, many were destroyed by crushing them while at their work of destruction. The beetle appears to work almost exclusively at the base of the smaller twigs, upon the branches. On several trees almost every twig was completely girdled at the base. The burrow of the beetle was not deep, extending but slightly under the bark, and none that were examined were over one-fourth of an inch in length, and were all confined to the base of the twig. These were mostly covered by the exudations of the sap, the fresh work only showing the castings of the insect, and the defined borders of the excavations. I observed no larvæ, but do not doubt that a more thorough examination would have shown their presence.

"The cedars on the grounds of Dr. J. W. Crowley also suffered by the same insect, as doubtless did other trees in the city.

"I shall watch for this beetle next season with considerable interest, and hope to make a better study of its habits, and become more familiar with its mode of work."

The following description of *Phæosinus dentatus*, Say, is abridged from LeConte:

In the genus *Phæosinus* the stalk of the antennæ is much shorter than the club; the first joint is rounded; the remaining four joints are closely united, and gradually broaden; the club is large, oval, compressed, obtusely rounded, and divided by straight sutures.

The *Phæosinus dentatus* is smaller than the other species of the genus, except *Ph. punctatus*, and the declivity of the wing covers is more abrupt and flattened. The striae on the wing covers are impressed and scarcely punctured; the interspaces are wide, and densely and strongly granulated and wrinkled, the wrinkles becoming sharp tubercles upon the declivity of the alternate interspaces, the second interspace not depressed on the declivity, and furnished with a row of smaller tubercles in some specimens. The head is granular and punctured, and the front not ridged. The color of the beetle is a

light brown, with darker thorax. The grub is small, white and curved. Length of beetle, about one-sixteenth of an inch. Form, cylindrical. Is said to inhabit the Middle and Eastern States, and Canada.

I may add to the above account of its habits, that in Dr. Packard's compilation upon Forest Insects, published as Bulletin No. 7 of the U. S. Entomological Commission, the insect in question is described as mining under the bark of the trunk of the cedar, "making a short, straight primary gallery, with about fifteen to fifty longer secondary galleries branching from it at nearly right angles, often ending in round holes perforating the bark."

Dr. Packard states that living beetles were found May 2d and 13th in the burrows, which also contained full-grown larvæ, but no pupæ were observed.

The development of this beetle in our State is a matter of great concern with us, and as we have not noticed it in the native cedars growing about Manhattan, although its presence would it seems be readily detected without special examination, we are led to inquire if this insect may not have been imported with cedar trees from the East. If further study shall show this to be probable, there is then hope for the cedar in Kansas, if the trees now discovered as infested be promptly destroyed with their borers. We may further state, that this insect has been recorded as very injurious to the arbor vite also.\*

#### DISCUSSION ON ENTOMOLOGY.

D. DOYLE, Oswego: To protect orchards from the canker worm, cover the bodies of trees with a wrapping of wool, fastened at the lower side with twine. The female being wingless, therefore not able to fly, in her efforts to ascend into the tree gets entangled in this wrapping, and will be held at the base, where it can be easily destroyed with scalding hot water or a sprinkling of kerosene oil. Cotton batting can be safely used for such wrappings, and is much cheaper than wool. This method, if resorted to at the first approach of warm weather in spring, will prove a success. Birds are man's ally in this work, and should be afforded every encouragement to live and breed in an orchard. Gourdshells and little boxes suspended in trees furnish such inducements to wrens, bluebirds, &c.

F. WELLHOUSE, Fairmount: I am of the opinion that spraying the trees with some insecticide in solution is fully as effective and much cheaper than any banding method. To exterminate the root-louse, saturate the ground around trees attacked by them with hot lye. Young trees to be planted can be cleaned of this insect by dipping their roots into a weak form of lye.

N. P. DEMING, Lawrence: Cinders from a lime kiln, or air-slacked lime, sown broadcast under trees attacked by the root-louse, are means for their extermination.

Discussion closed, and the following report was read:

#### HORTICULTURE CONNECTED WITH FARMING.

BY J. A. DOW, JR., HARTFORD.

Horticulture connected with farming, I take to mean the cultivation of fruit and ornamental trees, small fruits, flowers and garden vegetables, with the growing of corn, wheat, and other field crops. Farmers' horticulture differs from the general pursuit only that it becomes an element in a mixed husbandry, and is not in any sense special. The management required leading to success is the same; and the advantages, while generally considered as an additional comfort to the family, are often a pecuniary gain—at least to the extent of the disposition of any surplus of the product.

\*See American Entomologist, 1880, p. 108.

The planter is, should be among the first efforts to open up and improve every farm, or as early as the soil can be made suitable to receive them. Many farmers plant a small apple and peach orchard, and rest with these apparently satisfied. Such know not the comforts of having their tables supplied each day with the luscious pear, or the rich fruits of the strawberry, raspberry, or blackberry; and many fail to give the attention necessary to have a supply of even the common varieties of garden vegetables, all of which can be so easily grown that the means and time required would hardly increase the burdens of daily life. The greatest neglect among Kansas farmers is in not surrounding their homes with shade trees, which add beauty and comfort to the grounds; and with flowering shrubs and plants, which give fragrance and refinement to its inmates. They are frequently compelled to labor hard for a living, but that is no reason why such comforts, which add to rather than take from their happiness, should not become a part of life's avocation. They do not impoverish but enrich the one who cares for them, and provide an abundance for those whose lot it is to share life with them.

Agricultural writers are strong in their recommendations of a mixed husbandry as the only reliable system to avert the calamity of want in seasons unfavorable to some branches of the industry. Corn may fail, wheat may fail, but in such years the orchard or small fruits may not fail, and often have proven to be quite a source of revenue to the farmer when other products have not been remunerative. Some farmers complain of the work required to furnish first-class garden vegetables, and yet they require very little attention. Plant your gardens in rows, that they may be cultivated by horse-power, the same as corn or potatoes. Then with very little hoeing the work is never felt, and a supply of good wholesome table food is secured.

The mistakes made in the early settlement of our State in fruit-growing need not now be repeated, any more than in corn-growing. Suitable varieties have been determined for our climate, and experience has furnished a knowledge of safe methods to be pursued in their culture, and there are persons in almost every community posted in these matters who would cheerfully impart such information to him who desires it. Brother farmers, heed these suggestions, and haste to provide for yourself and family those things which cannot fail to make you and them happier and healthier, and throw around your children ties which will hold them to their homes as the one place above all others the most attractive.

At the close, the meeting adjourned to 9 o'clock A. M. the following day.

## FORENOON SESSION.

WEDNESDAY, December 17, 1884.

The Society was called to order by the Vice President, who announced the following committees:

*On Membership*—J. B. Schlichter, A. N. Godfrey, J. G. Clark.

*On Fruit Exhibited at the Meeting*—A. Allen, Judson Williams, Wm. Cutter.

*On Auditing Accounts*—C. H. Graham, Wm. Cutter, H. Dubois.

*On Final Resolutions*—L. A. Simmons, D. Doyle, M. Allen.

*Delegates to the Annual Meeting of the Mississippi Valley Horticultural Society, elected by the Society*—G. C. Brackett, Abner Allen, G. Y. Johnson.

On motion, the following committee was appointed, to nominate a list of Society officers for 1885 and 1886: L. A. Simmons, E. P. Diehl, C. H. Graham.

The report of Committee on Vine Culture was called for and read by the chairman:

### VINE CULTURE.

BY J. G. CLARK, WAVELAND.

This fruit has been successfully grown throughout the length and breadth of the United States, and although history records its culture centuries ago, it is only quite recently that a general attention has been given it. At the present time the demand for this fruit is greater in its season than of any other class grown on our continent; and the cheapness with which it can be grown has placed it within reach of the masses.

#### PROPAGATION.

Grape-vines are very easily propagated from cuttings. These should be made about nine inches in length, of the one-year-old wood, tied in bundles of about fifty cuttings each, with their tops one way. To preserve them through the winter and until planting-time in the spring, dip the bottoms of these bundles in a thick mud made of clay soil and water, and place in a trench, dug about one foot deep, in a well-drained, sheltered location, with the butt end up, and cover all with fine dirt to about four inches above the cuttings, and add a mulch to prevent their freezing hard. The whole should be covered with boards to turn off excessive rainfalls.

#### PROPAGATION BY LAYERING.

This can be done successfully by placing the new or old canes on the bottom of a shallow trench, and fastening them down with pegs or hooks, and covered with an inch of earth until the buds shall have grown a few inches in height, and thereafter adding more dirt occasionally as the growth extends upward.

#### PLANTING CUTTINGS.

This should be done in spring, after the ground has become warm enough to plant corn. The earth should be prepared as for a garden; set in rows four feet apart and three inches in the row, and keep well cultivated. Young plants should be dug up in the fall and "trenched-in" for the winter, in a location well drained and secured against hard freezing.

#### LOCATION.

The best is such as is naturally well drained and rich, having a sloping inclination—it matters but little which way. Such location should be deeply plowed and replowed, and the last time with the run of the slope, to facilitate drainage, and each time thoroughly harrowed. Just before planting, mark off the land with a plow for rows eight feet apart each way, north and south, as the trellis should so run; for if these are constructed east and west, the vines and fruit suffer from the force of southern winds against them. Set a plant at each crossing of the furrows, with the roots well spread out and covered three or four inches deep. Deep planting is not best in Kansas. Keep well cultivated through the first year.

#### TRELLISING AND TRAINING.

The vines need no support the first year, but trellises should be ready at the opening of the second year. In December of the first year prune off all shoots, leaving only one and the strongest. Cut this back to about fifteen inches of the ground. Trellises should have posts every eight feet, and the first year need only one wire stretched about one foot from the ground. I am in favor of the arm system of training; hence, under this method, only one wire will be needed to confine the shoots, which should be trained right and left from the plant, and are to form the base of the system, and all others should be rubbed off. When this shoot has reached four feet in growth, pinch off the end. From these arms will develop laterals, which will become quite strong by the close of the season, and should be cut back to only one bud; and before the coming

spring the trellis is ~~also~~ have a second wire added to it, one foot above the first. This affords the best support for the vines, and is all that is needed for the complete success of a vineyard. The growth which forms from the laterals, as soon as of sufficient length, should be fastened to the second wire. This system is to be continued each succeeding year.

As the vines grow old, the fruit spurs and reserve buds sometimes fail near the base of the arms, and the growth at the extremities becomes too strong. In such cases it is necessary to start new arms from the stump of the vine, and at pruning-time cut away the old arm, substituting the new one in its place. Under this system a vineyard may be kept in a vigorous condition, provided good cultivation is given it each year, indefinitely.

#### PRUNING IN SUMMER.

This I have not practiced. I sometimes cut away the ends of rank-growing canes, when they interfere with culture of the land, or are overtopping weaker vines, but in so doing am careful not to expose the fruit to the heat of our summer suns.

#### CULTIVATION

Should be given each week until the fruit is full grown, or until August 1st, whenever the land can be worked.

#### MARKETING FRUIT.

Our present markets are not altogether satisfactory to the producer. If he could reach the consuming class directly, there would be a great advantage secured over the present means for a disposition of the product. The best package I have found is a tight twenty-pound box, which can be nailed together. We need a factory that can supply the demand on short notice. I lost a fine trade in Colorado in 1884, simply because I could not find needed boxes to ship with. Baskets may answer when the millennium comes, but they are not proof against the pilfering expressman of this age.

#### DISCUSSION ON GRAPE CULTURE.

J. W. WILLIAMS, Cope: Summer pruning has been claimed to be beneficial to a crop of fruit.

PROF. E. A. POENOE, Agricultural College: I have found a ten-pound basket, having a strong cover, the most desirable measure for a grape-shipping basket.

J. G. CLARK, Waveland: I think a twenty-pound basket equally as desirable. Rot is caused by neglect in cultivation of a vineyard.

E. P. DIEHL, Olathe: In wet seasons vineyards do best if allowed to run to weeds. They absorb the moisture, and thus prevent rot.

J. G. CLARK: Weeds do not facilitate evaporation of water from the ground.

D. DOYLE, Oswego: Have seen fine crops grown in weedy vineyards for one or two years; after that, failure began. Thorough cultivation, and judicious pruning and mulching in dry seasons, generally insure good crops.

WILLIAM CUTTER, Junction City: I find that good Osage orange stakes will hold vines for ten years.

N. P. DEMING, Lawrence: Bees destroy my grapes, and as soon as they commence I am obliged to gather the crop to save them.

A. ALLEN: Wasps open the way for bee attacks.

Discussion closed. Next in order was taken up the following paper:

#### RUSSIAN FRUITS: THEIR VALUE AS COMPARED WITH THE SOCIETY'S VOTED LIST.

BY WM. CUTTER, JUNCTION CITY.

Russian apples are no new thing in this country. Robert Manning and John M. Ives in the New England Fruit Book, and S. W. Cole in the American Fruit Book, de-

scribed the Duchess of Oldenburg and Red Astrachan for ~~the~~ <sup>as cooking apples.</sup> It is not unreasonable to suppose that many other varieties ~~by them~~ tested in this country, and rejected—all for the want of the irrepressible tree ~~to~~ <sup>to tell us that a three-</sup> year-old tree will bear a half-bushel of apples as big as quart bowls.

We are all of us acquainted with these two varieties named. They are in all nurseries, and notwithstanding hundreds of Russian varieties have been tested since, the best authorities consider them the only two at all worthy of cultivation. I have been acquainted with these two and the Emperor Alexander for over twenty years, and with the Tetofsky for ten years. I find the Duchess and Tetofsky to be the only ones that justify planting, and they are *so sour* they are only fit for *cooking*.

Their non-productiveness is caused by the poor union they make with the stock. They unite about as well as the Bartlett and Kieffer pears upon the quince. They are necessarily very slow-growing and short-lived trees. It takes four years to grow them large enough to plant, and longer than I ever knew one to live, to become of a size sufficient to bear ten bushels of apples.

Threaten the life of a tree, and it goes into bearing: tie a fence-wire around the body of any variety at the ground, and it will bear as soon as the Duchess, and live about as long. In 1871 I planted forty-three four-year-old Duchess. About one-half of them are still alive. Their bodies now measure from fourteen to nineteen inches in circumference, and they bear from two to five bushels each year.

In the same rows are Lowell, Grimes's Golden, and Maiden's Blush, planted at the same time, that measure twenty-six to thirty-two inches, and bear from six to fifteen bushels per tree. The last three varieties are no more vigorous or productive than the average of our recommended list. From my experience it is no exaggeration to say they bear three bushels to one of the best Russian variety, and *ten* to one of the Red Astrachan, or Emperor Alexander.

I have another variety, of which I lost the name. I raised it from cions imported in 1867. It is now seventeen years old, and bore its first fruit this year—three little worthless sour apples.

The Duchess is the worst tree in my orchard to sprout. Also, it is troubled most by borers.

We are now testing about twenty of J. L. Budd's recent importations, among them his best keepers. Also, ten varieties of pears, and some other fruits. Several varieties, like the Duchess, do not unite firmly with the stock in propagation. The short summers and long, severe winters in Russia destroy all trees that do not mature their growth and fruit in a few months. When brought to this country, the same habits follow them. On this account, by the last of August they have finished their growth, and, of course, ripened their fruit—making it entirely impracticable for Kansas to expect a winter apple from Russia. Even in their own country they gather their apples before ripe, in order to save them through winter.

The Russian apricot is usually raised from seed, and, like other seedling fruits, varies in size, color, and time of ripening. I am informed by people living among the Menonites, that they nearly all have apricots, and they are no surer to bear than the better sorts—for sale in all nurseries for less money.

That great damage has been done to the fruit interest of Kansas by the sale of hundreds of thousands of these comparatively worthless Russian fruits at extortionate prices, none will pretend to deny. Therefore we take the liberty to ask a few questions and give our own answers.

How is it done, and who is responsible for the mischief? First, the innate desire among Americans to outdo their neighbors and astonish them with a wonderful fruit. The foreigner is always hankering after something better than we have in America.

The average farmer is also to blame for his carelessness in regard to the names of fruits. He remembers the name of every animal and of every variety of corn, wheat, and potatoes on his farm; but of a winter evening when he wants a Genet to eat, he asks his wife to "bring up some of them *streaked apples* from the box behind the pork barrel." Such people are easy victims to the smooth-tongued tree peddler, whom they never before saw, and who sells them something they never heard of. These agents are usually strangers from abroad. They are compelled to work, steal or starve, and they usually choose a half-way course between the first two. Of late they do not always represent foreign nurseries. Several of the oldest and most extensive nurserymen in our own State, finding that the venders of Russian fruits, pear on French stock, seedless grape, grape-vine raspberry, and other humbugs, were getting away with their trade, have turned loose upon us a set of the most unscrupulous villains that ever disgraced God's footstool. But woe to the man who attempts to expose one of these fellows! The proprietor comes down upon him like an avalanche; threatens him with the strong arm of the law for interfering with legitimate business; and finally, as a quietus to all doubt, tells him his agent is a church member in good standing.

Now, gentlemen, to show you that this doubt or positive denial of the value of Russian fruits for Kansas is widespread, I will quote from letters I have received from the best authority in the United States.

Last March I wrote to J. L. Budd, Professor of Horticulture at the Iowa Agricultural College, as follows: "Do you think there are any Russian apples that we in Kansas should plant, where the Early Harvest, Maiden's Blush, Grimes's Golden, Jonathan, etc., are hardy and productive?" He answered: "No; where such varieties are hardy and productive you have no use for the Russians," and went on to state his hopes of their success in the north of Iowa, etc. Prof. Budd spent a year in Russia, visiting all parts, and collecting all fruits of value. He is to-day undoubtedly the best-posted man on the subject in the United States.

E. Y. Teas, of Dunreith, Ind., writes November 8th, 1884: "There is not *one* of the Russian varieties of apples tested in this State, or, so far as I know, in the Union, that has developed qualities that entitle it to preëminence. I believe the best are Duchess of Oldenburg and Red Astrachan, and possibly Alexander. If these have gone above medium, it is undeserved pushing and not their value that has done it. Better things may truthfully be said of Prof. Budd's late importations that are not yet tested. The best apples yet tested for us and for your locality came from the South. Ben Davis, Winesap, Rawle's Genet, Roman Stem, and Grimes's Golden, are worth more to us than any *ten* that originated north of southern New York, so far as present experience goes." E. Y. Teas is one of the oldest and most careful nurserymen and fruit growers in the country, and he knows whereof he speaks.

I also have a letter from the oldest and most thorough of American nurserymen and experimenters, Ellwanger & Barry, of Rochester, N. Y. They write, November 29th, 1884: "We have fruited a great many of the Russian apples, so called. This season we have had Peter the Great, Titorka, Ananasnoe, Belborodoskoe, Arabskoe, Kapsnoi, Limnoi, Autonroka, Ostrowskve, Tschénœ, Drewe, Nicolager, Anise, Nova, and others. Some of these are fruits of good size and fair-looking, but we have not experience enough with them yet to be able to say whether any of them will be valuable as keepers. We are inclined to think not, here. They may be of value in severe north and northwestern climates. We must give them a fair trial." These men visited Russia several years ago for the purpose of obtaining new fruits. Their experimental orchards are the largest in America. Their business is passing from one generation to another. At Rochester, the Baldwin, Rhode Island Greening and Northern Spy are their best winter varieties: they are only late fall in Kansas. Therefore we have no room to hope for anything from Russia but a lot of summer and fall cooking apples.



## DISCUSSION ON RUSSIAN APPLES.

On motion of L. A. Simmons, the discussion was opened by the following resolution:

*Resolved*, That in the opinion of this Society all the Russian varieties of apples are unworthy of general cultivation in Kansas, and should be stricken from our voted fruit list.

The following discussion then ensued:

D. DOYLE, Oswego: The Duchess of Oldenburg is a poor bearer, but a nice-appearing apple.

A. ALLEN, Wabaunsee: I have tried many of this class, and observed many grown by other persons, but have failed to find an experienced grower who considers them of value.

D. DOYLE: We should strike the entire list from our recommended varieties, for the purpose of defeating the efforts of tree peddlers in swindling the people of our State.

A. H. GRIEBA, Lawrence: Planters do not generally get Russian varieties of apples when they order them.

L. A. SIMMONS, Wellington: I wish to place this Society on its responsibility by this resolution, and hope all present will vote. By its adoption we do not prevent anyone from planting this class if they wish.

Question was called, and the vote stood 17 in favor and 5 against its adoption, which was announced by the President.

Next in order was read the following paper:

## NEEDED LEGISLATION.

BY L. A. SIMMONS, WELLINGTON.

1. In some of our new counties there is a part, say one-third or one-fourth of the territory, which is especially adapted to stock-raising; or a like portion is peculiarly adapted to fruit-raising; while a broader area is mainly useful for grazing, or *vice versa*. Yet, under our statute, the whole must adopt the "herd law," or its benefits be lost to any portion. We suggest it should be amended so that it may become operative in any single township or number of townships, less than a whole county.

2. Under our present statute the assessments are made by the township trustees, and as no restriction is placed on the action of these officers, they generally base their estimates of the value of land upon their own notions, whims, or judgment. In many townships I have ascertained by actual inquiry, that a farm on which there is a bearing orchard is assessed at a far higher rate than one of like quality on which the owner has neglected to provide this family blessing. Again, where a large grove or timber tract has been growing several years, the owner is assessed heavily, because by reason of his enterprise and foresight some acres are becoming very valuable. Often have I heard leading well-to-do farmers declare they would increase the size of their orchards but for the almost ruinous taxation imposed upon such improvements. Hence, from irrational and unjust taxation, a strong restraint is placed upon the pursuit of horticulture. We would suggest that the law be so amended that the land devoted to orchards, groves, shrubbery, nursery stock, and all timber plantations, shall be taxed at no higher rate per acre than land of the same quality in the same neighborhood, upon which wheat and corn are annually raised.

3. The often-described and lamentable condition of school-house grounds we pass by as familiar to all, and earnestly suggest an amendment to our school law, by which each district shall be required annually to levy a tax for the purpose of fencing, improving, and ornamenting with trees and shrubbery the school-house site of the district. It should be made the duty of the district board to expend the money so raised in the improvement and ornamentation of their school grounds, and in keeping them in good cultivation; and the neglect to perform this duty should subject them to a penalty.

4. Another needed amendment of the school law should not be forgotten. We propose that first and second-grade certificates be only granted to those teachers who are qualified to teach the elementary principles of botany, entomology, and meteorology, in addition to the branches now required by statute. As the law stands, teachers will only qualify themselves to teach the branches named in the statute; but if they are forced to qualify in these additional branches they will soon do it, and will hasten to teach what they learn—what zealous teacher would neglect it?—at least by some object lessons.

5. In the matter of marketing fruit, not a little confusion and perplexity is occasioned by a defect in our statute of "weights and measures." If fruit was sold by weight, as we are informed it is generally on the Pacific slope, our statute should establish from 40 to 48 pounds as the weight of a bushel of apples or peaches, and  $1\frac{1}{2}$  to  $1\frac{1}{2}$  pounds as a quart of berries; but as a general thing, with the exception of grapes, all our fruits are sold by measure. Hence we should have a statute fixing the size of barrels for apples, crates for peaches, plums, etc., and the size of quart berry boxes. Apple barrels should probably be required to be of such dimensions as to contain  $2\frac{1}{2}$  bushels, crates one-third of a bushel, and berry quarts to contain either 58 or 67 cubic inches; for I hold that when a man buys a quart of berries, he should get a quart, and not a pint and a half—which is about the quantity usually found in the quart boxes shipped to our part of the State.

6. That some sort of protection to our orchards and berry-fields should be provided for by statute, no one interested in horticulture can reasonably doubt; and yet, approach the subject in any manner we may, we find very serious obstacles, owing, to a great extent, to the partial settlement and undeveloped resources of our State. A stringent law, requiring each orchardist to keep his premises clear of injurious insects, to use all available means for their destruction, and to prevent the spread of the several pests from farm to farm, might entirely conform to the wishes of the people in the eastern third of the State, where a large portion of the people are more or less engaged in fruit-raising, and where the damages from the prevalent pests amount to many thousands of dollars each year; but in the western third such a law would be hooted at as chimerical and useless, and even in the middle third would stand as a "dead letter," not having a sufficient number of advocates to compel its enforcement. From a careful consideration of the whole subject, we have reached the conclusion that, taking into view the present situation of the different portions of our State, it is at the present time inadvisable to urge upon the Legislature the passage of such a law as would afford adequate and complete protection to the numerous orchardists in the older-settled portion of the State; that an attempt at the present time to secure such legislation would not only prove futile, but might stir up such a feeling as would for many years stifle all legislation in the desired direction.

Believing with the poet, that

"Of all the ills that human kind endure,"  
The share is small that laws or kings can cause or cure,"

and realizing that it will most probably be entirely useless to petition for or attempt to secure by any influence we are able to command or control, the passage of a law as thoroughly efficient and beneficial as the one lately sustained by the highest court of California, still we do not feel like resting idle, but firmly believe that the time is propitious for taking steps in the direction indicated.

The stock-raising interests have recently received at the hands of the Legislature, direct and positive aid and partial protection by the establishment of the office of State Veterinary Surgeon and an investigating commission; and it does seem as though in view of the aid so rendered to the stock-growing and stock-dealing interest, the present Legislature would look favorably upon a demand by the agricultural and horticultural por-

tion of our community for the creation of a new State office, that of State Entomologist. The following resolution, recently adopted by the Sumner County Horticultural Society, presents the position we take quite accurately:

*"Resolved, That we believe the great interests of agriculture and horticulture imperatively demand the establishment of the office of State Entomologist; that the duties of such office should be prescribed by statute, and such salary provided for said officer as will enable him to give his entire attention to the duties of his office."*

If it is deemed advisable to attempt a step further, as paving the way for legislation of the character which is now really needed, and which at no distant day will be indispensable to our prosperity as a fruit-growing people, we would suggest a law providing for the appointment or election of a county horticultural commissioner in each county of the State, prescribing the duties of his office—the chief of which would be to act in conjunction with the State Entomologist, answer his inquiries and distribute his reports as to injurious insects and the best-known remedies, and possibly providing some compensation for his services. Could we secure the passage of an act or acts establishing these offices, and were they filled by active, energetic, zealous officers, the citizens in each county would, in the course of the ensuing two years, most certainly receive a large amount of valuable information, and probably derive pecuniary benefits to such an extent that the idea of protective legislation for our trees and shrubs would be popularized, and the coast made clear for the adoption by the next Legislature of a law sufficiently stringent to meet the necessities of our situation. Call this, if you will, a half measure, and I reply that "the half loaf is better than no bread;" that all of us realize that we had to creep before we could walk; and in my judgment it is all that it is advisable to attempt, lest our efforts result in utter failure.

I will close by copying a resolution passed on the 5th inst. by my own county society, as it expresses my views exactly:

*"Resolved, That in the opinion of this Society 10,000 volumes of the Annual Report of the State Horticultural Society should be published at State expense, and the means provided for their general distribution."*

All of which is respectfully submitted.

On motion of E. P. Diehl, the paper was referred to the following committee, who were requested to report their suggestions by resolution:

*Committee on Needed Legislation*—M. Allen, C. H. Graham, A. M. Switzer.

#### MISCELLANEOUS BUSINESS.

HON. F. P. BAKER, U. S. Commissioner of Forestry, suggested to the Society the importance of taking steps to secure a law establishing the office of State Entomologist.

N. P. DEMING approved of the suggestions, and said: Insects are rapidly spreading and increasing in the State. Relief should be given through State legislation.

C. H. GRAHAM, Leroy: The most successful means to secure this, as well as all other legislation, is for members to work with their respective legislators, and at their homes.

After a short time spent in discussing the measure of a desirable apple barrel, and best styles of berry boxes, the meeting adjourned to 1:30 o'clock P. M.

## AFTERNOON SESSION.

WEDNESDAY, December 17, 1884.

Vice President Newman in the chair, who announced, as the first exercise in order, the reading of the following paper:

## THE VALUE OF THE RUSSIAN MULBERRY PRACTICALLY CONSIDERED.

*(Illustrated with one-year-old trees.)*

BY J. J. MEASER, HUTCHINSON.

In presenting this paper to you, I will state as briefly as I can, what has come under my observation during the past two years concerning the Russian mulberry as a tree suited for wind-breaks on the prairies of Kansas. When planted in a single row around the farm, we will say from two to four feet apart in the row, and well cultivated for at least three years after planting, and allowed to grow without pruning, it will form a very dense growth of limbs from the ground up, and of very spreading habit, while the main stem makes a fair upward growth. In this way, for wind-breaks and shelter-belts, it is by far superior to any other tree; and where the soil is loose, and easy to drift in the spring-time, such rows of trees at three years' growth, across the farm at intervals of forty rods, running east and west, will certainly be of great value to the farm in checking the fierce winds. It retains its foliage until late frosts, and during the long dry spells in summer it remains fresher and greener than any other tree grown in this vicinity.

On the uplands it does equally as well as upon the bottom lands—does well upon any good corn ground. Seedlings should always be selected for planting wind-breaks as well as for forest purposes. Trees grown from sprouts or cuttings are not so good, and form a dwarf, scrubby habit; while good seedlings, with good tap-root, will make a clean, thrifty growth. I have seedlings, grown from seed planted in May, this year, that are from four to five feet high, and grew in a very thick row, 25 to 50 plants per foot. The growth is fully one-half better than the silver maple or catalpa, side by side, from seeds planted about the same time.

For forest plantations, I would select good bottom, or any good corn land, and plant good one-year seedlings, one plant to every four feet, in rows four feet apart; cultivate well for three years, and prune all the under branches off every year for five years. This will give them straight, clean bodies of good height. At the age of five years, thinning should commence by taking out the crooked trees for fire-wood, grape stakes, etc.; and thin them out every year, as necessity demands, in making a good forest. A plantation of a few acres on every farm would, in a very few years, produce all the fire-wood, poles, and posts that a good-sized farm would require for the various farm purposes. The plants can easily be grown from seed, if planted about the first of May in any good garden soil. In planting two acres, 4x4 feet, it would require about 5,500 plants. In five years, if well cared for, at least one-half should average eight inches in diameter, which at three posts to each tree would make 8,250 posts; at fifteen cents each would count up \$1,237.50, besides the other half for fuel, posts, etc.

## DISCUSSION OF THE PAPER.

A. M. SWITZER, Hutchinson: My experience differs from that of Mr. Measer. Those trees which he has shown were grown on land where the roots reach down to water. This variety generally forms a scrubby tree. It is only desirable for the fruit it bears. The ash and some other sorts of forest trees are more desirable.

D. DOYLE, Oswego: I planted a large lot of seed of this mulberry, and among the trees grown from that seed are trees only three years old which measure fifteen feet in height.

J. B. SCHLICHTER, Sterling: My observations and experience sustain Mr. Measer's statements as correct, and receive my indorsement. I like the fruit when mixed with gooseberries; it gives a flavor similar to that of the raspberry mixed with pie-plant. I think I can see in this variety a promising tree, for our section of the State at least, and will present its value in my report on Forestry.

Discussion closed.

By invitation, the following paper was read:

#### THE CULTURE OF SMALL FRUITS, FROM ACTUAL EXPERIENCE.

BY E. G. CLARK, WAVELAND.

Any land that will produce good corn or potatoes is suitable for the strawberry. It should be cleared of all rubbish, and plowed as deeply as practicable; (subsoiling would be an advantage, I am confident.) Pulverize thoroughly with a fine-toothed harrow, and, if lumpy, mash and smooth the surface with a drag.

To prepare for planting, stick stakes in a line where the rows are to be made, and mark the line by running a wheelbarrow from stake to stake, which makes a mark sufficiently plain to set by. Let a hand go ahead and open holes with a bright spade in the center of the marked line from six to eight inches deep, by thrusting the spade down in a perpendicular manner, pushing it from him sufficiently to open the ground to receive the roots of the plant. Another hand follows with plants. Each one should be held in the hole with its roots spread out in fan shape and against the perpendicular side of the hole made with the spade, with one hand, while with the other pull in fresh moist dirt and pack it firmly against the roots, leaving the land around the plants level. Cultivate during the first year with a five-tooth horse cultivator, and hoe until the ground freezes, then cover the entire land with mulch. In the spring, when the danger of frosts is past, part the mulch immediately over the rows, but leaving it in the spaces between rows to keep the land moist and the berries free from injury by contact with the earth. As soon as the fruiting season is over, clear off all mulch, and cultivate as during the previous year. •

#### RASPBERRY AND BLACKBERRY.

Ground suitable for the strawberry will answer for these classes, only that it should not be quite so rich. Its preparation should be as recommended for strawberry. When ready for planting, stake the rows, and with a plow open a furrow to such depths as required to receive the plants with their roots in a natural position. Let one hand go ahead and drop the plants in the furrow, about three feet apart, and another follow with a hoe. Place the plant in proper position against the land-side of the furrow, and pull in the dirt, packing it firmly on the roots.

As soon as the current growth of the raspberry cane has attained to two feet in height, with a sharp corn knife clip off the top, to induce a lateral growth. The blackberry should be given a higher growth before clipped—say about three feet. The benefits of this cutting-back are: First, a lateral growth is secured, which increases the bearing surface of the plant, and strengthens the canes against being torn off by wind storms; second, it tends to cause a matured condition which is not so liable to injury by severe cold of our winters.

It has been claimed by some that these berries do best on poor land. Such has not been my experience with them. From land that will yield sixty to eighty bushels of corn, I have realized the best crops.

#### ELECTION OF OFFICERS.

The President announced that the election of officers was in order, and called for the report of the Committee on Nominations.

The committee reported through its chairman, L. A. Simmons, the following:

REPORT ON NOMINATIONS.

*For President*—Rev. E. Gale, Manhattan.

*Vice President*—M. B. Newman, Wyandotte.

*Secretary*—G. C. Brackett, Lawrence.

*Treasurer*—F. Wellhouse, Fairmount.

*Trustee for Central District*—E. P. Diehl, Olathe.

On motion, the report was adopted, and the ballot of the Society ordered to be cast for the nominees for the respective offices as named in the report.

The President of the Burlingame Horticultural Society was called to the chair while the annual address was delivered.

ANNUAL ADDRESS.

BY M. B. NEWMAN, VICE PRESIDENT, WYANDOTTE.

*Members of the Kansas State Horticultural Society:* This eighteenth anniversary of the existence of our Society has again called us together to consider the important questions concerning the horticultural interests of our State. Unfortunately the absence of our esteemed President, now seeking restoration to health in the more genial winter climate of Florida, causes the preparation of the annual address to devolve upon me; as also the duty of presiding over our present session. Under these circumstances, of which my notification has been very recent, I feel, and must earnestly express the desire for your generous forbearance and coöperation, to enable me to discharge in a satisfactory manner the requirements of the position.

It would have added much to the interest and enjoyment of this meeting if it were possible that we could each bring with us more encouraging reports from our respective localities of the practical results of horticultural work in Kansas since our last annual meeting; but while those in attendance from the more favored counties of the southern portion of the State are happily able to bring with them reports of great horticultural blessings, those from the central and northern portions of Kansas have to acknowledge numerous discouragements. The effects of two unusually severe successive winters, while materially affecting the vitality of many of our orchard trees, our vineyards and other small-fruit growths, have not at the same time correspondingly diminished the hosts of pests with which we have to contend—our insect and fungoid enemies. The effects of two such winters, or even more, in succession, could have been more patiently endured had they caused corresponding destruction of the annoying foes of horticultural industries.

THE IMPENDING CRISIS.

In reference to these insect pests, it will be well for us to more thoroughly consider the necessity of combined and vigorous action to obtain the mastery over them. The fossil remains, imbedded in the various formations of geologic time, fully prove to us that numerous genera of past organic existence have become extinct, and in turn have been superseded by others better fitted for success in the great struggle for existence. The fact is thus rendered apparent that these remarkable changes of the past are simply the preludes of like events yet to occur in the great drama of organic life. It is an old and well-accepted adage that "history repeats itself;" and it remains for us to solve the problem whether we or our insect enemies shall prevail in the now impending struggle for self-preservation. It is true that, individually considered, these insect foes are insignificant forms of organic existences; and that, to the superficial observer, they present no formidable features of antagonism to us. But when we more deeply study their astounding power of multiplication, and the insatiable voracity with which they invade all the fruits of our agricultural and horticultural industries, we become awakened to the

serious apprehension that unless successfully restrained by the warfare we may wage against them, it is only a question of time when they will have so thoroughly vitiated all of our food supplies as to leave an actual insufficiency for the healthful sustenance of the human family.

#### CONDUCT OF THE WAR.

What course shall we take to avert this impending evil? Clearly no individual efforts are adequate to the emergency. Combinations in school districts, townships and counties, would be steps in the right direction. The larger the combinations, and the more unanimous the coöperation may be, the better will be the probable results. But united and unanimous action throughout the entire limits of our State, supported by well-considered and efficient legislation, specifying duties to be observed, and providing adequate penalties for neglect of the same, are apparent necessities; and the extension of such system throughout the States and Territories of our entire country is probably the only efficient mode of warfare against the formidable hosts of enemies now invading the products of our agricultural and horticultural industries. These destructive pests must not only be met at all points of contact with our respective industries, but even their breeding-places must be so thoroughly destroyed that their actual extermination may, if possible, be effected. For then, and not until then, can we expect full immunity from their further depredations.

The discoveries of the past few years in the matter of the *germ theory* of diseases abundantly prove the germ origin of several of the most serious maladies afflicting mankind and our domestic animals. And they further demonstrate the fact, both as to man, our flocks and herds, that those individuals of each class which are in the best physical condition, and are descended from the most vigorous parent stocks, are almost wholly exempt from the ordinary contagious effects of such diseases. Now considering, in this connection, the well-observed fact of horticultural experience that fruit trees, etc., of the best constitutional vigor and origin, are least affected by the various insect and fungoid injuries to which our orchards and gardens are exposed, we arrive at the conclusion that these conditions of exemption are clearly analogous. If so, then a most important step in our warfare with these pestiferous enemies should be to wholly eliminate from our orchards and gardens all those feeble and otherwise susceptible varieties that constitute their chief breeding-places and nurseries. After this shall have been accomplished, our more exclusive attention may be directed to such thorough and well-considered cultivation and sustenance of such varieties as may, by abundance of healthful sap, prevent the hatching of the ovæ, or drown out the possible larvæ in their incipient stages, and thus, if possible, accomplish the utter extinction of many species of our relentless foes. Or, falling short of actual extermination, we may at least so far reduce their numbers, and their facilities for material increase, that many years of after neglect will be required to enable them to regain their present potency as competitors for the products of our horticultural labors.

#### WHAT CHEER?

But as the darkest clouds are often lined with the brightest bordering, so also are our numerous discouraging horticultural conditions ameliorated by cheering recollections of many past years of abundant plenty; and the assuring prophecies from these of the many future years in which we may, in abiding faith, hope for the repetition of such blessings. Indeed, the entire history of Kansas fruit culture embraces so many pomological triumphs that it must be considered unpardonable weakness on the part of those who would despondingly contemplate the abandonment of the great work in which we have been, on the whole, so successfully engaged. More favorable seasons than the past two years have been the rule in Kansas; while these two have been decidedly exceptional. And as to the insect and fungoid antagonisms, as sure as man has been the chief creative work in

organic life, so surely must we eventually triumph in our warfare with the physically weakest forms and families of the animal and vegetable kingdoms. Hence, *never despair* must be our motto so long as we maintain confidence in the superiority of man over all lower organic existences, and so long as the many cheering recollections of past horticultural successes retain their impression on our memory.

#### NEW SEEDLING FRUITS.

Feeling confident of the approval of our most earnest and progressive pomologists, I again venture to call attention to the matter of our new seedling fruits. The importance of new varieties, more specially of our orchard fruits, adapted to each peculiar locality by the special physiological effects of origination therein, is steadily becoming a more conspicuous feature in our horticultural literature. Admitting that we have many varieties in cultivation in Kansas that are doing admirably and hopefully, yet the fact that so many of our old Eastern favorites are utterly disappointing to us here, most clearly proves that only in the localities of their origin, and in others of closely corresponding conditions, do any of our orchard fruits afford the most satisfactory returns to the producer. Such facts should energize our efforts for the production of new seedlings for the varied conditions of all parts of the State. Several very promising varieties have already been originated within our borders; but still there is room for many more; and our greatest pomological triumphs will most probably be yet achieved through *Kansas fruits of Kansas origin*.

#### FORESTRY INTERESTS.

The important matter of our forestry interests still claims, as heretofore, our earnest attention. The reports of our intelligent and judiciously selected Committee on Forestry are accompanied with practical suggestions. I must therefore limit my remarks to a few general observations on the subject. I think it is but voicing the most intelligent sentiments of our State to assert that no discouragements hitherto met are sufficient to induce us to abandon or even diminish, in any respect, our efforts for the advancement of this great interest of our State. With the many failures that have hitherto attended our various experiments in forestry culture, there have been mingled a sufficient number of successes to encourage continued effort. Wherever a single forest tree has been made to grow, the fact is thereby demonstrated that, under like conditions, other trees can be made to grow. And the physiological law is becoming well understood, that where even the growth of a small nucleus of forest trees may be secured, the effect on the immediate location is to raise the conditions for further successes. And these conditions will in like manner become still more extended, and so continually enlarge the areas thus affected. With these considerations, the hope is surely reasonable that in time our vast treeless plains may be clothed with abundant forests, and that these in turn will secure such improved conditions of soil and climate as will richly bless the coming dense population of central and western Kansas.

To our Committee on Needed Legislation, I must advise earnest and unfaltering attention to our forestry interests at the approaching session of the Legislature. Particularly should they revive the unfinished action of the last session on the subject of one or more experimental forestry stations in our State, and, if possible, secure the passage of some well-considered law in relation thereto. To obtain full statistical statements of practical operations of such stations, already established in other States, will doubtless greatly aid the effort to secure a like provision in the laws of Kansas. The vast interests involved in this forestry question must in time awaken the most stupid legislator to its proper consideration.

#### DIGEST OF TRANSACTIONS.

At this, our eighteenth annual meeting, it may be well to consider the propriety of compiling a proper digest of our past transactions. Such a digest, embracing in a well-



arranged and systematic form all that is most worthy of lasting preservation in our numerous volumes of transactions, is becoming every succeeding year a greater apparent necessity. By commencing such a work now, we may have it in readiness for publication by the end of the second decade of our existence as a Society—a very appropriate time for the issuing of such a volume. The importance of such a work may be fully understood when we refer to the fact, that we have now about ten times the population in Kansas that we had during the earlier periods of our transactions. Hence much is contained in our earlier annual publications which is now almost wholly inaccessible to nine-tenths of our present population. And owing to the limited number of copies of each subsequent volume published, the desideratum is proportionally felt in regard to all our later issues. It should therefore be considered whether the preparation and publication of such a digest would not render much important horticultural information accessible to many thousands of interested parties now actually precluded from such opportunity.

The labor of preparing such a digest would appropriately devolve upon the respective chairmen of our standing committees, with provision that each shall avail himself of such assistance as may be obtainable from other intelligent horticulturists who may be willing to aid in the work. The special interest of such a volume in marking the successive stages of horticultural experiences in Kansas, would add largely to the practical value of the work, and render it a most acceptable volume for the libraries of all intelligent citizens of our State.

#### CONCLUDING REMARKS.

In conclusion, I must reiterate the suggestions so often, but by no means too often heretofore uttered, as to the great importance of continuing energetic effort for the development of the horticultural interests of Kansas. Our work thus far has conferred upon many thousands of new settlers in our State the full benefits of those experiences which have cost us so much to acquire. And we still meet from time to time in our sessions, to collect our further experiences, and in turn to scatter these abroad with willing minds and willing hands. In this, our chief reward is the gratification we receive from seeing the blessings these confer on the toilers in the horticultural fields of our adopted State; but at the same time, we each feel the individual benefits of our renewed interchanges of ideas and further experiences, and at each separation we fully appreciate that our increased stores of horticultural knowledge have more than recompensed the time and money spent. Adding to these results the social enjoyments attending our meetings, we are by these varied inducements stimulated and encouraged in carrying on our work, so long as we may find the same to be useful and necessary. And this implies continued work for remote posterity.

On motion, the address was referred to Committee on Needed Legislation.

The address was followed by a paper prepared by the U. S. Forestry Commissioner, F. P. Baker, of Topeka, on the progress of the work in the United States. [This will be found in the department devoted to Forestry, in this volume.—SECRETARY.]

On motion, a vote of thanks was unanimously tendered the Commissioner for his valuable contribution to the Society's proceedings.

The President called for the following report, which was read:

#### REPORT OF THE COMMITTEE ON VEGETABLE GARDENING.

BY HENRY MANWARING, LAWRENCE.

The success of all gardening operations depends largely on preparatory measures, and the beginner in this pursuit should move cautiously, step by step, learning as he goes.

All lands will be much benefited by liberal manuring, which should be in a thoroughly decomposed state. The preparation should be thorough by deep plowing and

pulverizing, and if the plowing is done in fall and again in spring just before planting begins, the best results will be realized.

The following list may be relied on as safe, and yielding a product of the highest excellence. It is arranged in alphabetical order:

*Asparagus*.—Conover's Colossal.

*Beans*.—Early Snap, Golden Wax, Black Wax. For shelling: Large and small Lima. Plant early.

*Beets*.—Egyptian for extra early, Dewing's Improved for second early, and for main crop and winter use, sow these varieties later in the season.

*Cabbage*.—Henderson's Premium is earliest of all; Henderson's Summer and Fottler, second early; Late Flat Dutch, Stone Mason, for late and winter use. Drumhead and Mammoth Marblehead are large, but the last-named does not endure the intense heat as well as the others.

*Cauliflower*.—The Snowball has proven most desirable.

*Carrots*.—Early Scarlet Short Horn, Half-long Stump Rooter; for late, Danvers and Long Orange.

*Celery*.—Henderson's White Plume is a self-bleacher and a dwarf variety, and is the best. Henderson's Half-dwarf and White Walnut are also desirable varieties. For tall-growing sorts, the Giant White Solid is the best.

*Corn*.—The earliest of all is the Marblehead, an amber-colored kernel; Narragansett and Minnesota, red kernel. Second early, Triumph and Amber Cream. Late, Stowell's Evergreen and Egyptian. The Mammoth Marblehead is a short-stalk grower, and bears large ears; is some earlier than the last two named.

*Cucumbers*.—Improved White Spine, Early Frame, and Tailby's Hybrid are each early, though to be preferred in the order named. The last-named is a cross between the White Spine and English Frame, yields a larger product, and continues bearing longer than the Improved White Spine.

*Egg Plant*.—New York Improved.

*Kohl Rabi*.—Early White and Purple Vienna.

*Lettuce*.—Black-seeded Simpson is the best early variety; does not head. Of the headers, Salamander, Hanson, and Golden Stone Head are the best. The Hanson forms the largest heads. All these varieties are free from any bitterness or unpleasant flavor, tender and crisp.

*Muskmelons*.—Early, the Hackensack; late, Montreal Market. These are both netted.

*Watermelons*.—For early, Finney's Early; for extra quality, Icing; for main crop, Scaly Bark, Cuban Queen, and Gypsy.

*Onions*.—For sets, the potato variety is the earliest; the Queen, Extra Early Red, and Early Red, are the earliest grown from seed; and for a general crop, the Globe.

*Parsnips*.—Very early, the Early Turnip; general crop, Long Smooth, or Hollow Crown.

*Peas*.—Early, Henderson's First of All, and American Wonder. For a succession for family and market, plant the American Wonder in season as needed.

*Parsley*.—Should be started in a hot-bed, if wanted early.

*Potatoes*.—Early Ohio, best early variety. The Early Maine and Lee's Favorite are favorites with some planters. Of the Boston and Chicago Market, the first is best. Gem, Surprise and Beauty of Hebron have their admirers. These are all early varieties. Of the late varieties, White Star is a good yielder and excellent in quality. Mammoth Pearl, St. Patrick and Grange yield heavy crops, but are coarse in quality.

*Radishes*.—Extra early, Early Round, Dark Red, White Turnip, and Red Turnip. The French Breakfast and Wood's Early Frame are good sorts. For winter, California

**Mammoth, White Winter.** An early crop of radishes can be grown successfully by running the seed drill along the tops of early-potato rows, and matured for use before the potatoes will interfere.

**Squashes.**—Early, White and Yellow Bush Summer Crookneck; autumn, Butman and Boston Marrow; winter, Hubbard.

**Tomatoes.**—Livingston's Perfection, and Favorite.

**Turnips.**—Very early, the Extra-early Purple-top Munich, Red-top Strap-leaf, White Strap-leaf.

#### DISCUSSION OF REPORT.

D. DOYLE, Oswego: I drill onion and radish seed together, for the reason that the onion plants are so small when they first appear they are difficult to find, while the radish plant, being of a larger size, will mark the rows plainly, and will be out of the way of the onions by the time the ground is needed.

M. ALLEN, Hays City: I plant cabbages with such classes as make a slow growth.

PROF. E. A. POPENOE, Agricultural College: To destroy the flea-beetle and cabbage worm, dust the plants with pyrethrum powder, or syringe them with tea made from it.

H. A. STILES, Pavilion: Parasites hold the noxious species of insects to some extent in check, under the undisturbed provisions of nature; but the efforts of man have disturbed nature's remedies, and hence the preponderance in numbers of certain species. We need the help of a capable and practical entomologist, which should be given us, and supported by State enactment. Show up the immense character of damage done in this direction to your legislators, and cease not to press upon them the necessity for action.

Discussion closed.

#### REPORTS OF COMMITTEE ON OBITUARY.

DECEASE OF F. A. CHILDS, COLUMBUS, VICE PRESIDENT FOR CHEROKEE COUNTY.

*Whereas*, It has pleased an overruling Providence to take from our midst our brother, F. A. Childs, of Columbus, Cherokee county, who has at all times been an interested and worthy member of our Society, ready at any and all times to help the interests of horticulture: therefore, in honor and esteem of our deceased brother, be it

*Resolved*, That this Society fully realizes the irreparable loss it has sustained; and that we extend to the bereaved family the earnest and fraternal sympathy of this Society. Further,

*Resolved*, That the Secretary is hereby instructed to furnish a true copy of these resolutions to the family of the deceased.

E. P. DIEHL,

L. A. SIMMONS,

C. H. GRAHAM,

*Committee.*

DECEASE OF A. ELLIS, ELK CITY, VICE PRESIDENT FOR CHAUTAUQUA COUNTY.

*Whereas*, It has pleased an all-wise God to remove from us our brother and co-worker, A. Ellis, Elk City, Kansas, who was at all times an efficient and hard worker in the field of horticulture: therefore, in honor and esteem of our deceased brother, be it

*Resolved*, That this Society fully realizes the great and irreparable loss it has sustained in the death of our dear brother; and that these resolutions be made a part of the minutes of this Society.

Respectfully submitted.

E. P. DIEHL,

L. A. SIMMONS,

C. H. GRAHAM,

*Committee.*

On motion, the reports were adopted. Adjourned to 7 o'clock P. M.

## EVENING SESSION.

WEDNESDAY, December 17, 1884.

Vice President Newman in the chair. Exercises were opened with music; after which the Vice President announced in order the welcoming address.

## ADDRESS OF WELCOME.

BY HON. WILLIAM THOMSON, OF BURLINGAME.

*Mr. President, and Members of the Kansas State Horticultural Society:* On behalf of the Burlingame Horticultural Society, within whose domains you now assemble, I am bidden to extend the right hand of fellowship, and greet you with words of welcome. You are gathered together in this annual meeting to discuss, promote and encourage the science of horticulture. Horticulture in Kansas! A quarter of a century since, that proposition would have been scoffed and jeered by your brethren in Iowa, Illinois, and Missouri. Grow trees in Kansas? Grow fruit there? The soil will not nourish them. The winds will uproot and overturn them. The sun will scorch them. The drouth will kill them. Many of those "formerly of Kansas," who have since returned eastward to their wives' relations, murmured and lamented: "Wherefore have ye made us come up out of Egypt, to bring us up unto this evil place? It is no place of seed, or of figs, or of vines, or of pomegranates. Neither is there any water to drink." These, and kindred objections, met the hardy pioneer, who, journeying with the Star of Empire, proposed to adorn the billowy prairies of Kansas with gardens, orchards, and forests. He was not discouraged by Lochiel warnings of disaster. He plowed, planted, and pruned. Sometimes the soil was unsuited. Occasionally the winds did uproot; the beams of Old Sol did scorch the more weakly; the clouds did not always yield their moisture when desired. The planter soon learned that the products of the ground were subject to the attacks of many of the same enemies that inhabited the older States, and a swarm of new ones, unclassified and unnamed. He found that many species of trees, hardy and vigorous in his old home, were unable to adapt themselves to their new situation. On the other hand, families that had been utter failures there, thrived and flourished here. It was an experiment, but it was the experiment of an enthusiast whose very necessities impelled him onward. He wrought against many odds. In the older States, experience was a lamp of unerring guidance to the planter. In this new region it was only a will o'-the-wisp; for experience transplanted is itself an exotic.

The lesson was soon learned, that many old rules must be forgotten in order that new ones suited to the different conditions and surroundings might be discovered. But his persevering energy triumphed, and his indomitable will surmounted the obstacles strewn by ignorance in the pathway of success. Little by little, and inch by inch, he gained. He held fast to what was good. He was gradually growing a Kansas experience. His knowledge was widening and deepening. Alone and unaided, his progress was slow. The experimental knowledge of an individual is but an atom, compared with the aggregated wisdom of a commonwealth; but these atoms of individual experience compose the mountain of empirical knowledge. This truth was not ignored by the Kansas horticulturist. He associated with those who sympathized in a common pursuit. From time to time these met, and each unloaded into a common fund his observations, brought from field and garden. These gatherings grew in importance, and fifteen years ago, under the fostering laws of our State, ripened into your corporation. From the time of the reception of your charter, your officers and members have made the objects of your Society a labor of love. You are here to-day as enthusiastic in your pursuit and dissemination of

knowledge as when first planting the seeds. Your efforts have been rewarded with results far beyond the brightest conceptions of your founders.

Upon the pinnacle of the prosperous height to which our State has ascended, let us pause in retrospection, and view these great results which you, as public benefactors, have aided, encouraged and encompassed.

A brief outline of the achievements of the horticulture of Kansas shows what wonderful progress has been made in less than a quarter of a century. To you, who soon after the birth of our State undertook the task of discovering and disseminating among our citizens the best methods of cultivating and a proper knowledge of the care and protection of the productions of our soil, we give unbounded praise. You have encouraged a science which must yield untold and unnumbered benefits to Kansas, long after every one of you have gone

"To the lone couch of his everlasting sleep."

It is said that Sir Christopher Wren, the designer of the beautiful and imposing cathedral of St. Paul, was buried in a crypt in that edifice, with only a marble slab to mark the spot, bearing the inscription:

"Si monumentum requiris circumspecte"—

if you seek my monument, look around. So, many years hence, when our beloved State shall have reached its acme of power, civilization and wealth; when your organization may have broken, and your members may have scattered; when the rolling prairies of to-day shall bloom and blossom all over as a garden; whoever seeks to learn what mighty work you have done, the answer may well be, "Look around."

Again I bid you a hearty welcome, and hope that your deliberations, as in the past, may be profitable and pleasurable.

On motion, the thanks of the Society were tendered for the kind sentiments contained in the welcome. The Rev. J. B. Schlichter responded in behalf of the Society, in expressions of gratitude to the citizens of Burlingame and their horticultural society for the generous and hospitable reception and entertainment extended to the members of the State Society.

After a fine entertainment of music, the following paper was read:

#### LESSONS FROM HORTICULTURE.

MRS. J. E. RASTALL, BURLINGAME.

The influence of horticulture upon the minds, manners and tastes of those who engage in it as a calling, and of those who regard it or any of its branches as a thing of beauty to be enjoyed as a gratification of sense, has been ably discussed before this Society many times. It is a subject to which the mind reverts with pleasure, and which conjures up vivid pictures, both of imagination and of recollection. Many lessons of practical utility have been drawn therefrom, and in this day of exhaustive thought and research, when there remains no new thing under the sun to unearth in this as in other departments of study, the most that can be done is to recall a few thoughts that may be profitable or amusing. Nature was designed for study and for pleasure—a two-fold profit from a single source. One of our poets has said:

"Nature hath made nothing so base but can  
Read some instruction to the wisest man."

And among all of nature's productions none can be found so intimately associated with the life of man, or which so fully illustrates that life in every shade of thought. From this field He who spake as never man spake drew largely to emphasize truth. As

the horticulturist moves among the trees he has planted, and in the growth and development of which he is so vitally interested; as he carefully prepares the soil and scatters the seed, as he with greatest care transplants the young and tender vine or plant, his whole efforts spring from the comforting assurance, "What a man soweth, that shall he also reap." A glance at the moral field he is cultivating, with the same thought in mind, might not be to him quite so satisfactory, but the truth applies equally to both. He finds among his fruit-bearing trees one which yields some kind not expected, and which he cannot recognize—it certainly does not belong to the variety he supposed he was cultivating; the tree bore a wrong name; the fruit it produces proves the fact, for the tree is known by its fruit, an immutable law. Men do not gather grapes of thorns or figs of thistles. Appearances or professions are not the tests of character.

A young clergyman of the Protestant Episcopal church was given a position as curate of a church the membership of which embraced many persons of culture and taste. His friends were very anxious for his success, especially in view of the fact that in disposition he was retiring, he lacked self-confidence, and was easily embarrassed. In a short time these failings were entirely overcome, and he was very popular with his congregation. Friends questioned him in regard to the wonderful change, without which success would have been impossible. He explained that he had conquered his weakness by careful preparation, "and then," he said, "I go into the garden and preach to the cabbages, trying to think I am before my congregation; then when I am in the pulpit I endeavor to convince myself that I am addressing cabbage heads." To draw lessons from horticulture, his example must be followed.

In a horticultural audience, among the people of the garden, every species, and the various types of species, are frequently represented. Those that first attract attention are not always of the highest type. The tallest trees bear no fruit; the brightest and largest blossoms frequently yield no perfume, or one from which the observer instinctively shrinks. Here is a tree hugging its dead leaves in the spring of the year—living in the past, unwilling to give up opinions or prejudices—the outgrowth of years gone by—until the bursting buds of new developments crowd them into the grave. There are fruit trees of every variety of character and flavor, to suit all tastes; some bearing early in the season, blossoming and promising a bountiful harvest before others are clothed with leaves—like a child of genius, the development of which is manifest before character is developed or education begun; others that by tedious process only develop the best results of life when the beauty and the glory of the earlier have been enjoyed and have passed away; the last a better variety, because one which keeps during wintry storm when others fail. These are the truest friends—friends of adversity. How closely the audiences of the church and the garden resemble each other! So much alike! Is it a dream? It must be the garden! Ah! yes; and here are others worthy of observation: luscious fruits on lowlier stems—vines, so called—not capable of self-support, yet yielding for others abundant blessings—a profusion of berries or of grapes; and the lowliest of all, unable to raise itself above the earth, which it clothes with beauty from early spring to winter's frost, multiplying roots, blossoms, and a fruitage unexcelled. To enjoy this but little effort is needed, and that little is well repaid; yet he who would gather must stoop.

Here is a piece of ground where vegetables grow. These are not æsthetic, but practical, consequently desirable. The leaders are tuberous; they grow unseen, in silence and in darkness. No eye watched their development, or attempted to train them for future usefulness. But in time of need they come forward ready for use, to comfort the needy, to sustain the poor, and to add to the blessings of the wealthy. This is God's way of training leaders, and history tells us that they are always ready when needed. Next in order is the cabbage. Just watch its development. Germinating, the first leaves give

no indication of what may be expected; plants of other varieties have now the same general appearance. Soon its character is unfolded, and its nature can be seen. All its efforts now are to make a great spread—display without value. As time advances, it learns to look within and pay attention to proper self-development, and the result is what some call a head and others a heart. How like an audience in a church! Adjoining is a bed of lettuce, differing in character. It does not grow wise with age, but always makes more display in proportion to size. It is very valuable as a salad, on the table or in society, and destroys the monotony of life.

And right here are onions. No need to appeal to Webster to learn that union and onion being synonymous, in onion there is strength. But mark the tenacity of the union. See how closely the individual parts of it are enfolded together, how perfect the bond of sympathy between them. Separate them, remove them far apart, subject them to fire or any form of persecution, the character is still unmistakable. It will not belie itself, or profess to be anything different. Much abused and maligned, it is a fine type of constancy, for

You may boil, you may fry, you may bake, if you will—  
The scent of the onion will cling to it still.

But it is aristocratic. It comes of a very ancient family, and can trace its lineage back through many centuries. It grew in Egypt during the days of Joseph, and his children learned to love it so that they mourned when they left the country because they were deprived of its companionship. Ever since it has been a blessing to man in diet and in medicine. But it is not appreciated. Once in a lifetime, perhaps, it may be, as when the demand for it in camp during the civil war came up so plaintively. At such times it is avenged. It has caused many to rejoice, but more to weep.

The benefactor of the garden is the asparagus. It always has something to give to a good cause, to nourish or to decorate; but it is first useful, then ornamental, and is always welcome, on the table of the epicure, or in the bouquet. It seems to link the world of flowers with the more useful vegetable kingdom.

And speaking of flowers, see, this way. How fragrant and how beautiful! How they raise the drooping spirits, inspire the saddened heart, and intensify the joy of the happy! What a charitable mission is theirs! Here is the rose, the queen of society; the violet, fragrant and beautiful in its humility; the lily, glorious in its purity; the daisy, sweetly modest; the tulip, gorgeous and wealthy; the verbena, prodigal with its gifts; the pansy, true and sincere; the geranium, delightful in its constancy; and many others. See how the young, the middle-aged and the old alike delight to hover around and share in the delight of their existence, and mark how pure and elevating their influence; how they cheer the despondent and speak hope to the bereaved. But do you see that nettle? How out of place! True type of trouble, which recognizes no boundary line. Grasp it firmly and it will not sting; fear it, and touch it carefully, and you will be painfully rewarded.

Strange, is it not, that all these grow in the same soil—all have the same kind of food and drink, and yet they are so dissimilar. Each, true to the purpose of its Creator, gathers from the same elements just what is needed to develop the one idea of its existence. Shall we hold it in contempt for that, and call it a plant of one idea? Is it sinful, or weak, or foolish, to be true to a purpose divinely given? Is it desirable that, even as an experiment, the apple tree bring forth pears—the cherry tree, plums—the thistle, figs? Would not confidence in God be shaken? Every individual thing, vegetable or animal, was created for a purpose—sent on a mission, with an idea to develop to which its existence must be devoted. In the higher natures this purpose becomes conviction. Dare we ask any one to set aside convictions because ours differ? With the same surroundings, the same elements to sustain both mind and body, if one is so consti-

tuted as to gather through every sense of sight or sound the constituents of a great conviction, be sure it is God's will, and respect the one-idea, because it is of God.

At the close, a vote of thanks was tendered Mrs. Rastall, when the meeting adjourned to 9 o'clock A. M. the following day.

## FORENOON SESSION.

THURSDAY, December 18, 1884.

President Newman in the chair, who announced the following:

### SECRETARY'S ANNUAL REPORT.

*Mr. President, and Members:* The practical work in the field of horticulture has closed for another year; and we have assembled to consider the outcome, and to derive from its results the lessons which they teach.

Kansas, with her millions of fruit and forest trees, her acreage of vineyards and small fruits, can scarcely be considered other than one of the *leading* fruit States in the Union; and while the product for 1884 was not all that could be desired in certain lines, her reputation as a favorable section has not been impaired, nor does it suffer in a comparison with results in other and heretofore more favored States.

### PRODUCT IN 1884.

The fruit crop of Kansas as compiled from reliable data, affords the following showing:

#### NORTHERN FRUIT DISTRICT.

Counties.	Apples.....	Peaches.....	Pears.....	Plums.....	Grapes.....
Per cent.					
Atchison.....	71		33	27	92
Brown.....	57		75	80	97
Clay.....	75			100	50
Cloud.....	95		50		90
Davis.....	38		70	50	100
Dickinson.....	78		55	75	100
Doniphan.....	64		50	75	84
Jackson.....	75		75	35	55
Jefferson.....	85	20	57	50	100
Jewell.....	75			35	100
Leavenworth.....	63		35	22	71
Lincoln.....	75	25	30	75	100
Mitchell.....	75	10	75	25	100
Nemaha.....	70		43	43	89
Ottawa.....	100	45	30	55	100
Pottawatomie.....	65		75		100
Riley.....	30		18	25	87
Saline.....	75	20	100	75	100
Shawnee.....	80		43	50	88
Washington.....	100		40	50	75
Wyandotte.....	70		50	60	75

#### PER CENT. FOR DISTRICT.

Apples.....	72.4
Peaches.....	54.7
Pears.....	47.3
Plums.....	47.3
Grapes.....	88.1



## CENTRAL FRUIT DISTRICT.

Counties.	Apples...	Peaches...	Pears.....	Plums....	Grapes....	Per cent.	
Anderson .....	44		46	18	53		
Barton.....	90	40	20	10	90		
Chase.....	33		50	50	100		
Coffey.....	75		80	80	80		
Douglas.....	50		37	37	56		
Franklin.....	75		30		75		
Harvey.....	100	65	35	87	100		
Johnson.....	50		25	100	100		
Linn.....	87		45	45	75		
Lyon.....	57		65	75	84		
Marion.....	80	18	100	25	80		
Miami.....	60		56	60	73		
Morris.....	90		25	75	100		
Osage.....	75		25		75		
Reno.....	63	50	63	88	100		
Rice.....	100	75	75		110		
Wabaunsee.....	42		25	25	100		

## PER CENT. FOR DISTRICT.

Apples.....	69 $\frac{1}{2}$
Peaches.....	14 $\frac{1}{2}$
Pears.....	48 $\frac{1}{2}$
Plums.....	50 $\frac{1}{2}$
Grapes.....	85 $\frac{1}{2}$

## SOUTHERN FRUIT DISTRICT.

Counties.	Apples...	Peaches...	Pears.....	Plums....	Grapes...
	Per cent.				
Allen .....	50		30	10	90
Bourbon .....	50		43	70	75
Butler .....	70	60	75	25	100
Chautauqua .....	40	10	100	50	70
Cherokee .....	40		58	33	83
Cowley .....	95	65	60	100	100
Crawford .....	45		15	35	83
Elk .....	75	20	50	50	100
Greenwood .....	50		100	10	20
Labette .....	45		100	20	40
Montgomery .....	43		72	30	58
Neosho .....	25		15	18	94
Sedgwick .....	80	100	60	40	90
Sumner .....	100	100	88	100	100
Wilson .....	50		50		100
Woodson .....	70		43	30	100

## PER CENT. FOR DISTRICT.

Apples.....	58
Peaches.....	22 $\frac{1}{2}$
Pears.....	58 $\frac{1}{2}$
Plums.....	38 $\frac{1}{2}$
Grapes.....	81 $\frac{1}{2}$

State per cent.: Apples, 66+; peaches, 13+; pears, 50+; plums, 45; grapes, 85.

## COMPARATIVE SHOWING WITH OTHER STATES.

States.	Apples....	Peaches...	Pears....	Plums....	Grapes....
Kansas.....	66	13	50	45	85
Michigan.....	66	19			
New York.....	75		60	60	60
Indiana.....	50		25	50	50
Missouri.....	58		45	80	50
Iowa.....	50		100	100	66
Ohio.....	42		33	30	62½
Illinois.....	30		60	80	60
Wisconsin.....	50		10	25	25

In the foregoing showing, we have the encouraging fact that Kansas, when compared as to her product with nine of the most favored and leading fruit States in the Union, is excelled by only one, viz., New York; and in connection with this fact is to be considered another, which undoubtedly contributed to the success in New York, viz., that during the three preceding years the crop in that State was very light, while for the same period in our State the crop was notably abundant. It is a commonly accepted conclusion that fruit trees must and will have a rest after successive crops, and with that rest of one or more years an abundant crop is reasonably assured to follow. This will in part explain the success in the State of New York, and the reduction in our own State. It is true that other causes figured to produce the failure of crops in New York, yet the loss was instrumental in the production of conditions of vigor which added materially to the success in 1884. But it will be seen by a review of crop reports for Kansas, running back over the period of three years, that the reduction of the crop in 1884 by the heavy crops of preceding years, was not large, and very far from even approximating a failure. The crop for 1883 was as follows: Apples, 67 per cent.; peaches, 22 per cent.; pears, 28 per cent.; plums, 60 per cent.; cherries, 53 per cent. And by an examination of the preceding year, 1882, as compared by States, we find the following—apples only: Kansas, 76 per cent. of a full crop; Missouri, 75 per cent.; Ohio, 37 per cent.; Iowa, 30 per cent.; Illinois, 33 per cent.; Michigan, 30 per cent.; Indiana, 20 per cent.

Further, let us make a comparison of the apple crop of our State for 1884 with that of Michigan—a State which has in past years stood at the head of a list of leading fruit States—and we find Kansas holds an even hand, and that in what is considered an “off year” with us.

There is another fact to be considered in regard to the per cent. fixed for Kansas, viz.: The reports which form the basis of an estimate are many of them from counties wherein the trees are young and not fully established in fruiting, and many bore their first crop of fruit in 1884. This circumstance must reduce the average of the State materially below what it would be if the reports were confined to such counties as have fully determined their true status.

Some features were developed in the product of 1884, to which I wish to call your attention, as I believe them to be deserving of your consideration as affecting to some extent the teaching of this Society. I have reference to the comparative yield and condition of the product in locations. The product of orchards on uplands was generally much less in quantity, and in many instances inferior in quality, to that grown on lowlands. In some locations this inferiority nearly rendered the entire product unmarketable, or reduced its value to the lowest market price. In the main, the product of past years has been superior where grown on upland. This question should be fully discussed, to determine whether the developments in 1884 are simply exceptions to the general results of locations, and should be so treated in future work.

There is another point which presents an interesting feature in the development of

horticulture in our State, which is the fine character of fruit produced in what may be termed the frontier counties on our west. It has often been said by visitors, as well as persons residing here, that the fruit sections were confined to the eastern counties, and that it would be useless to encourage any efforts in the western sections. To demonstrate the truthfulness or fallacy of such assertions, and to trace by a continuous fruitage its progress into the western counties, I called for a display of fruits for our Fourth Annual Fair, held at Topeka in September last, by counties. The response was promptly and cheerfully made by counties as far west as Reno, Rice, Barton, Ellsworth, Osborne, Jewell, and Ellis; from the south, Sedgwick and Cowley; and north, Republic. These are given as the limits, while the intermediate counties added displays to complete a continuous line. To such as had the opportunity of examining the frontier exhibits, I need not say that the symmetrical form, clear, waxen-like appearance, fine color, and excellent quality, were a surprise to many old settlers and veterans in pomology. In size only were these productions inferior, and this was the case only in the exhibits from extreme limits on the west. The defects caused by insects and climate, prevalent in some of the exhibits from eastern counties, were not found in any of these western collections. Sedgwick county, though ranking among the second-grade counties in age, boldly placed her exhibit in competition with those from the older and eastern counties, and received at the hands of the awarding committee the first premium; and well did that veteran settler of Kansas, and highly-esteemed friend of horticulture, Dr. Charles Reynolds, remark, after a careful review of the exhibits: "From the evidence before us, old Douglas and the eastern counties will need look to their laurels."

From such evidence, are we not fully justified in the declaration that horticulture in Kansas is not confined to her eastern portions?—and that in proper time, as settlements progress, it will extend over the length and breadth of her domain, and yield to every home the luxuries of the orchard and garden, and will surround them with graceful shade trees and lawns, and the beauty and fragrance of flowers.

I will now briefly give you a statement of work accomplished since the last annual meeting, by the Board through this office.

#### ANNUAL MEETING OF THE BOARD.

The Board met in Ottawa, on the evening of December 7, immediately after adjournment of the annual meeting; a majority being present. The chairs of the several standing committees were filled, as published on p. v of our Report for 1883.

At this meeting the Secretary was instructed to notify the members of the Legislature that having failed to appropriate an express or other fund with which to cover the expenses of moving the publications of the Society for 1883 and 1884, they would be requested to instruct the Secretary as to manner of shipping the portion which had been legislated into their hands for disposal.

On motion, the invitation of the Davis County Horticultural Society to hold the semi-annual meeting for 1884 at Junction City, was accepted.

On motion, a chair on Geology and Ornithology was added to the Society's department of standing committees. The first was filled by appointment of L. A. Simmons, of Wellington, and the second by Dr. Ivan D. Heath, of Wyandotte. These appointments were accepted; but subsequently Dr. Heath declined, on account of an arrangement to leave the State on a tour for scientific exploration. The vacancy was filled by the appointment of Prof. F. H. Snow, of the State University.

#### SEMI-ANNUAL MEETING.

This meeting was held at Junction City, on June 4th, 5th, and 6th, in response to a cordial invitation of the Davis County Horticultural Society. The delegate attendance was large and quite general from the State. The exercises were important, interesting,

and valuable. The reception given the Society was hearty, cordial, and highly satisfactory to all in attendance.

#### TREE PEDDLERS.

This class of men have been very annoying to the horticulturally inclined, the past year. With all the arts of delusion they invaded intelligent circles, and beguiled even some of the practically educated fruit men into purchase of their goods. Many complaints of fraud and swindling by them have found their way to my office; and while the victims are to be pitied for their folly, I am of the opinion that the surest cure is to let the disease wear out the patient, as in no other line of traffic are men willing to be duped by such incredulous statements as in that of fruit trees. But the conduct of some of these agents in certain localities has become of such a nature as relating to this Society, as to demand your prompt and unreserved condemnation. For instance, in certain localities agents are charged with claiming to be in the employ of the Society, which was growing a heavy stock for and under State authority, and the Society's warranty was given for all losses which might occur, to be made up the following spring! Upon close investigation these agents were found to be in the employ of well-reputed Eastern nursery companies, and a branch established at Topeka, Kansas.

#### SOCIETY'S ANNUAL FAIR.

The fourth annual exhibit of this Society was held at Topeka, in conjunction with the Kansas State Fair, September 11-16, 1884, and was made highly creditable to the State. Permit me here to state, that the objects of these annual displays of fruit are intended to be instructive to the public. They are held in the interest of no one locality, but for the benefit of the whole State. It is apparent to every fruit man that a comparison of collective exhibits, representing the different localities in our State, cannot be otherwise than valuable to the horticultural interest. Such exhibitions afford fine opportunities for the novice, and even the experienced fruit grower, to glean a knowledge of the different varieties grown in the State, which would require several years to obtain in any other way. The exhibitions are held for the benefit of the entire State, and without any expense accruing to the State. Respectfully submitted.

G. C. BRACKETT, *Secretary.*

The Treasurer's annual report was read, and on motion referred to the Auditing Committee.

#### DISCUSSION ON FORESTRY.

H. DUBOIS, Burlingame: I have discarded the black locust because of the trees being attacked and rendered worthless by borers.

J. G. CLARK, Waveland: This insect was quite prevalent several years ago, but from some cause has disappeared since. The hackberry possesses endurance and vigorous growth. We find it growing in various locations successfully—on stony points and dry and sterile lands, even on the arid plains of Arizona. It would seem to adapt itself to almost every character of soil.

R. P. MCCAULEY, Larned: I find it useless to attempt to grow any class of trees in Reno, Rice and Pawnee counties without first absolutely subduing the wild condition of the land by thorough tillage. We plant the cottonwood, which is short-lived in those counties, and by decay of their leaves and wood they add material to the land, and with their shade become valuable factors, aiding man in preparing the soil for the successful growth of a better class. We have just as much annual rain as falls in the eastern counties, but it is not so evenly distributed through the year. But we are becoming independent, as we are making irrigation available, which will secure a complete success to our efforts to grow trees, etc.

J. B. SCHLICHTER, Sterling: True, our soil requires good preparation before it will produce. The soil in Pawnee county cannot fail to produce when placed under the ad-

vantages of irrigation, and in many locations bottom lands are fertile without it. But the side-hill slopes will not prove successful without the means of irrigation. I would not plant the cottonwood with any other sort of trees. It is a gross feeder, and quickly impoverishes the soil, to the injury of other kinds. There appears to be a slight difference between the black locust and what is called the yellow. The last is freer in grain, and splits more easily. Honey locust grows everywhere with notable success. Ash-leaved maple (box elder) makes a nice tree. Russian mulberry assumes the form of an apple tree, and makes a desirable sort for the construction of a wind-break. Its fruit varies in size and quality. The cottonwood and black walnut, and some years the white maple, cast their leaves in August. Of evergreens, the red cedar has been a success. Black Austrian and Scotch pine have done well so far.

J. G. CLARK, Waveland: The hackberry succeeds on the Plains over forty miles from any watercourses, and on lands where wells have been sunk from two to three hundred feet without striking water.

M. ALLEN, Hays City: The hackberry is found growing upon our driest land, in places where vegetation can barely exist, and away out on the Plains beyond the one-hundredth meridian. I do not recognize any difference between black and yellow locust. This sort makes a nice growth the first year. It has been said that the borer does not trouble the locust trees around Denver. When there two years ago, I found trees twenty years old which evidently had been a prey to that insect at an early day in their life. Some of those trees were a foot in diameter. It is a valuable sort, even if the borer does attack it occasionally, but which is not the case until the tree has put on its rough bark. This and the ailantus are the best sorts for timber claimants to use—for by continual plowing near them a sucker growth starts up from the roots, and, annually spreading, will soon form a five-acre lot, without any planting save a few parent trees. These two sorts above all others maintain their existence and thrive on thin soils. Black walnut requires a deep, rich land, and is a bad neighbor for other sorts—therefore should not be planted nearer than within forty feet of an apple orchard.

J. W. WILLIAMS, Cope: I was partial to the black locust when a resident of Ohio. I loved the fragrance of their flowers, and their shade. I brought seed with me to Kansas, and planted in alternate rows with black walnut. Borers soon attacked the locust, and I helped them in killing the trees. In another lot, this sort grew to be six inches in diameter before they were attacked. These I left, and have found them valuable for fuel—cutting out only such as were injured, which were soon renewed by the sprouts which grew from the stumps. In another grove, which was formed with cottonwood and black walnut trees, the first kind has succumbed, leaving the walnut in good condition. I have a grove of burr oaks, planted seventeen years ago, which are on an average six inches in diameter, and are still thriving. The red cedar grows as rapidly as the black walnut, and is valuable.

D. G. GRISWOLD: I have the black locust planted in rows twelve feet apart, which are now twenty-four years old. When their growth had reached to three or four inches in diameter they were attacked by borers. I have found them very valuable for fuel and poles on a farm. I planted between the rows acorns and black walnuts, which are doing well. The locust trees have renewed their growth, but the borers, too, have renewed their attacks upon them. I believe there are two kinds of locust (you may for distinction call them black and yellow), the same as there are two kinds of cottonwood.

J. B. SCHLICHTER, Sterling: There are evidently male and female trees in the species named, and this may explain the different appearance. Trees act as a fertilizing agency of the land by their shade and by their retention of accumulating, decaying vegetable matter.

H. DUBOIS, Burlingame: The cottonwood tree is evidently short-lived on the prairies. I prefer the ash, hickory, etc.—hard-wooded species.

H. A. STILES, Pavilion: I have cottonwood trees growing on a northern slope which are doing equally as well as others planted in the valleys. Borers seem to work periodically in the black locust. Years ago I was told that borers would destroy the locust tree, and I threw away a lot of seed rather than take the risk of trying to grow them; but by accident one of them sprouted, and has now grown to a good-sized tree. This is on clay soil. Honey-locust wood is not durable; will soon decay if set in the ground. Hackberry trees along the streams near my residence have been nearly ruined by warty enlargements of their bodies, caused, as I think, by attacks of some insect. Kentucky coffee tree propagates readily by seed, and makes a rapid growth. There is no other tree more desirable for shade and ornament than red cedar. On upland or lowland it is equally valuable. Its wood resists decay, and the tree is easily transplanted and grows rapidly.

J. G. CLARK, Waveland: I would like to have Mr. Stiles inform us what insect attacks the hackberry. I have never learned of any.

H. A. STILES: I cannot tell the name of the species. I did not intend to discourage the planting of the hackberry, but simply record facts relating to it as I would of any other sort.

D. DOYLE: The hackberry, in my opinion, is one of the poorest kinds that we have. The white maple is preferable; it furnishes more and better quality of wood—hence is more profitable. But the catalpa and black walnut are valuable for all purposes. If the black locust was not troubled with borers, it would be most valuable. I would advise planters to give a thorough trial of the different sorts of forest trees, and determine their respective values.

Discussion closed.

#### REPORT OF THE COMMITTEE ON PRESIDENT'S ADDRESS AND ON MR. SIMMONS'S PAPER.

Your committee to whom was referred the President's annual address, and the paper read by L. A. Simmons, entitled "What are We Here For?" would recommend that a committee of three be appointed to prepare a digest of the annual proceedings of the Society in manual form and submit the same to this Society at its next annual meeting, for amendment, approval, or rejection.

Respectfully submitted.

E. P. DIEHL.  
E. A. POPENOE.  
J. G. CLARK.

The motion to adopt prevailed without a dissent.

On motion, the meeting adjourned to 1:30 o'clock P. M.

## AFTERNOON SESSION.

THURSDAY, December 18, 1884.

A. C. Easter, President of the Burlingame Horticultural Society, in the chair.

Mr. Simmons moved that the following gentlemen constitute the committee to prepare a horticultural manual as recommended by him in his paper entitled, "What are We Here For?" J. G. Clark, F. Wellhouse, Wm. Cutler, Abner Allen, A. N. Godfrey.

On motion of N. P. Deming, Jos. Savage was added to the committee.

The question to adopt was put, and unanimously carried.

#### REPORT OF COMMITTEE ON EXHIBITED FRUIT.

Your committee find on the tables the following exhibits:

By Martin Allen, Hays City: 7 varieties of apples, Rawle's Genet, Ben Davis, Willow Twig, Winesap, and others.

Jas. Hirst, Barclay: 5 varieties, among which are very fine Missouri Pippin apples.

N. P. Deming, Lawrence: Fine specimens of Baldwin apples.

E. Foote, Osage county, 5 plates of seedling apples, 5 named varieties, and 2 plates very fine quinces.

H. C. Scott, Osage county: A fine display, containing 10 varieties of apples.

E. K. Terry: 2 plates apples.

Wm. Cutter, Junction City: 4 plates apples.

J. G. Telford, Osage county: 4 varieties of apples.

H. Ward, Burlingame: 6 plates of apples.

H. A. Stiles, Pavilion: 12 varieties of apples.

J. G. Clark, Waveland: 4 varieties apples, and a plate of Beurre Easter pears in excellent condition; also a bunch of American chestnuts.

J. C. Ross, Osage county: 8 varieties of apples.

H. Dubois, Burlingame: 4 varieties of apples.

J. C. Dewey, Osage county: 2 plates of apples.

J. M. Bisbee, Wabaunsee: 3 varieties apples.

Joseph Savage, Lawrence: A plate of fine Stark apples.

D. Doyle, Oswego: 7 varieties of apples.

J. B. Schlichter, Sterling: 3 varieties of apples.

A. M. Switzer, Hutchinson: 6 varieties of apples.

Mr. Crumline, Junction City: 1 plate fine Niagara grapes.

H. L. Pratt, Osage county: 7 varieties of apples; 1 promising seedling.

Respectfully submitted.

JUD. WILLIAMS,

WM. CUTTER,

ABNER ALLEN,

*Committee.*

On motion, the report was adopted.

#### REPORT OF AUDITING COMMITTEE.

Your committee, to whom was referred the Treasurer's annual report, beg leave to submit the following: That after a careful examination of the Treasurer's report, compared with duly-executed vouchers for items set forth therein, they find it correct.

C. H. GRAHAM,

WM. CUTTER,

H. DUBOIS,

*Committee.*

#### REPORT OF COMMITTEE ON A PART OF PRESIDENT'S ANNUAL ADDRESS.

Your committee to whom was referred the President's annual address and the address of the Committee on Needed Legislation, would most respectfully report as follows:

1. That the Legislature be requested to establish the office of Commissioner of Forestry, whose duty it shall be to establish somewhere in the treeless portion of the State, an experimental station for the promotion of the art of forestry.

2. That as the school-district officers perform their duties entirely without pay, it might be impracticable to impose the additional duty upon them of ornamenting the grounds belonging to their several districts. Therefore we believe it will be best to leave this matter to the good sense and pride of the people of each district, and that these higher elements should often be appealed to until success in this direction shall have been achieved.

3. We would most earnestly recommend that the office of State Entomologist be established by the Legislature, with a suitable salary. For this measure we have to plead not only the ravages of insect plagues, but also the example of other and older States.

4. We would also recommend that the Legislature be earnestly requested to provide for a geological survey of the State at as early a time as practicable.

5. For the purpose of giving proper force and effect to the foregoing suggestions, we would also recommend that the Secretary of this Society shall prepare suitable petitions, properly headed, and place them in the hands of the several vice presidents in each county of the State, whose duty it shall be to procure signatures to the same and forward to their respective Representatives and Senators in the Legislature, not later than the first or second week of the coming session.

All of which is most respectfully submitted.

MARTIN ALLEN,  
C. H. GRAHAM,  
A. M. SWITZER,  
*Committee.*

On motion to adopt, the following discussion occurred:

M. ALLEN, Hays City: Your committee, after due time spent in deliberation, concluded that the establishing of the office of State Entomologist would cover all the necessities for a board.

N. P. DEMING, Lawrence: I am satisfied with the report of the committee, so far as it goes. But we must have some legislation to protect the industry against neglect and practices which endanger the interests of others.

L. A. SIMMONS, Wellington: I am satisfied with the report, and shall feel well pleased if the Legislature gives us a State Entomologist.

#### MISCELLANEOUS DISCUSSION.

D. DOYLE, Oswego: The catalpa makes a beautiful ornamental tree for dooryards, and is valuable for its wood. For fence posts it has an endurance not equaled by many other sorts.

C. H. GRAHAM, Leroy: The Osage orange is one of the most valuable trees for fence posts, poles, etc.; has no equal in durability of wood. Planted on good land, it makes a rapid growth. For fuel there is no other wood so valuable. The red cedar is one of the future trees of Kansas, for timber plantations.

WM. CUTTER, Junction City: I noticed along my route to this place, many worm-nests hanging to the forest trees near here.

D. DOYLE, Oswego: We have apparently the same insect in the forests of Labette county.

N. P. DEMING, Lawrence: The same has appeared in Douglas county, and is pronounced a species of the handmaid moth, by Professor Snow, of the University.

D. DOYLE, Oswego: In my county we are succeeding satisfactorily with the hard-shelled almond. The trees are as easily grown as peach trees.

E. PARKER, Argonia: There is growing in my neighborhood a tree belonging to the poplar family, which differs from the silver-leaved, Lombardy, or balm of Gilead. Can anyone tell me what it is?

L. A. SIMMONS, Wellington: The same is growing in Sumner county, and has been called the Athenian poplar.

A. M. SWITZER, Hutchinson: It is found in Reno county; does not sprout from the roots, as is the case with most poplars.

On motion, adjourned to 7 o'clock P. M.



## EVENING SESSION.

[NOTE.—The evening session was placed in charge of the Burlingame Society.]

THURSDAY, December 18, 1884.

A. C. Easter, President of the Burlingame Society, in the chair.

The exercises opened with prayer, offered by Rev. Levi Morse, of the city, which was followed with music. The President announced the reading of the following paper:

## DELIGHTS OF HORTICULTURE.

BY MRS. H. L. FERRIS, OSAGE CITY.

*Hortus* means garden; *cultro*, the knife. Hence horticulture properly means the culture of whatever was primarily raised in the garden, and which required the use of the knife.

In choosing our life occupation, we are apt to select such as are congenial to our tastes, unless circumstances over which we have no control make the earning of a few dollars a necessity. In this way many are led to follow avocations entirely distasteful to them, looking only to the necessary living to be made, rather than the pleasure of congenial work.

Yet the horticulturist rarely, if ever, follows his pursuit from a matter of necessity, but always from choice, for not only is there "a plowing and a planting," but a long, tedious waiting for gathering the fruits. This waiting prefaces a living in the interim; so the pursuit is not chosen unless the living be supplied. Thus it follows that the horticulturist seeks not only profit but pleasure in his work.

We have only to compare his work with that of other labor to see its advantages over any other occupation.

The carpenter sees only the amount of lumber which a tree will cut, and seeks to tear down nature to supply art. He only receives an artisan's pay for the time he labors, while the horticulturist receives nature's pay—a constant, steady, beautiful growth, while he sleeps as well as while he works.

The butcher is constantly engaged in the taking of life. So callous does he become that the sight of blood is a pleasure to him, even to such an extent that at one time the common law did not allow a butcher his testimony in a murder trial.

The horticulturist is constantly nursing life—watching vegetable growth, and carefully training the delicate tendrils, until he is always very watchful over all animals intrusted to his care.

The physician's life is one of sleepless, unrequited toil. There is poetry in the idea of "relieving suffering humanity," but it is neither poetical nor beautiful to inhale all the odors of a sick room, to deal out quinine, calomel, and ipecac—nor is at all poetical to take the stuff.

When the horticulturist retires, it is with the comforting feeling that he will be undisturbed. Morning finds him rested and refreshed.

"An ounce of prevention is worth a pound of cure." Apples, peaches, pears and grapes are better medicine than drugs, and infinitely more wholesome. They have assisted many poor, weak, over-loaded stomachs to digest their dinners, and saved many a long fit of sickness and a doctor's bill. As old Parson Blake said, "Dried apples are better than quinine."

The young lawyer masters the principles of jurisprudence, reads Blackstone, Coke, and Macaulay; talks of the beauty, dignity and majesty of the law, and opens up a "tem-

ple of Janus," whose doors are never shut. As a class, they will resort to any underhanded, petty trick, any amount of chicanery and buffoonery, to gain their point, and by shrewd, double-faced dealing work up all the cases possible, the sole object being money. There are some noble exceptions, however. It is this lawyer-love of gain and lawyer intrigue that subverts the majesty of the law, and makes it possible for the money of the brewer and saloonist to set at naught the prohibition law.

Horticulturists as a class are prohibitionists, notwithstanding the temptations of cider and wine. Their living is furnished by Dame Nature herself, and she only requires honest, earnest endeavor.

Having drawn a few comparisons between the horticulturist and people of other avocations, we will now dwell on the real delights which his business affords.

The horticulturist is an educated person. You who have attended these meetings have heard the able essays, have seen how they were appreciated and understood by the members of the Society, and have listened to the intelligent discussions that followed, need not be told of the fact. While the great majority of the active middle-aged men are engaged in business that seldom recalls the lessons of their school days, he has not only all he has learned at school fresh in his mind, but a wide field open for further research. This is a pleasure not to be estimated.

He must of necessity be a botanist, understanding the structure, growth and habits of the varieties of trees, shrubs and vines, else how could he successfully plant, train, graft, or prune?

Agricultural chemistry is another science which he needs. Analysis of soils, and its adaptation to different kinds of vegetable growth, is necessary; so that when the soil is impoverished, he may supply the missing elements in enriching fertilizers.

Entomology, zoölogy and ornithology are daily studies. It is not only necessary for him to know his insect foes and bird foes, but insect friends and bird friends, as well. It is one of the delights to sit and watch these and learn from observation, rather than from books, of their habits.

If he is a Latin scholar, it will be of service to him in understanding the nomenclature of these sciences, and he can the more intelligently read and write upon them.

The higher mathematics are of use to him, in the laying out of his orchards, groves and lawns. If he understands analytical geometry, he can originate new and beautiful designs for the ornamentation of his home.

There is a sort of individuality to every tree; and no one is better acquainted with these characteristics of tree growth than the owner who takes delight in visiting each tree, watching its growth, noting its progress, and giving it care, each successive round of visits only making them better acquainted, and, as it were, firmer friends.

A perfect man is endowed with five peculiar gifts or senses—hearing, seeing, smelling, tasting, and feeling, the proper gratification of any one of which constitutes pleasure. The more of the senses gratified, the higher the enjoyment. Horticulture calls into requisition all of the senses. We see the growth of trees, plants and flowers—their bloom and their fruit. We smell their delightful odors, handle the fruit and flowers, and taste the luscious fruitage. True, we cannot hear an apple grow, but we can hear it as it falls into the barrel, and listen to the music of the money which it brings.

#### FINAL RESOLUTIONS.

The Committee on Final Resolutions reported as follows:

Your committee would respectfully report:

*Resolved*, That the officers and members of the State Horticultural Society hereby tender the Burlingame Horticultural Society, and the citizens of Burlingame, their sincere thanks for the cordial reception and the bountiful hospitality given to them, during this the eighteenth annual meeting of the

Society; that thanks are hereby extended to the Baptist society for kindly permitting the use of their house for our meetings. Further,

*Resolved*, That we hereby tender our hearty thanks to the choir of Burlingame for kindly furnishing our evening sessions with appropriate music.

On motion, the report was adopted.

The remainder of the evening was very pleasantly spent in social talks, mingled with frequent entertaining pieces of music of a humorous and pleasing character. At the close of which, the eighteenth annual meeting adjourned *sine die*.

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# APPENDIX.

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# PRESIDENT'S SEMI-ANNUAL ADDRESS.

[This address was not available at the time needed, for the proper place.]

## ON THE SOCIETY'S WORK.

*Ladies and Gentlemen, Members of the State Horticultural Society of Kansas:*

Perhaps there is no other voluntary organization among men that brings together in one common field so wide a range of culture, and talent, and taste, and that awakens a common sympathy among men of so varied occupations, as that in whose interests we meet to-day. While I have before me men from all professions, and from most of the occupations of life, we find all working harmoniously and to one common end. We gather here to hold in the background our own special opinions. For the hour, it matters not whether we are allopathists, or homeopathists; whether we mean to vote for Blaine, or Tilden, or even Ben Butler; whether we are Calvinists, mild or strong; whether we for the time measure silk or tape, or follow the plow. We are here for one purpose—to forget all but the one object of allying ourselves and ours to the good and the beautiful in nature, and through nature coming nearer to nature's God.

As far as the interests of horticulture are concerned, we could hardly hope for a more auspicious gathering. While the reputation of our State as offering comfortable and happy homes to the men who are willing to work, has been steadily advancing for the last few years, it is well established that horticulture has played an important part in securing that reputation. Horticulture in its various branches has already become an immense industry. And yet the returns so far are meager indeed, compared with what they must be in a few years. Over three and one-ninth millions of apple trees were reported in bearing in 1883, while more than three and a half millions were not yet in bearing. The fruit from all these trees will be immense, to say nothing of the vast numbers that will be hereafter planted. This is only a single interest, while the culture of small fruit and gardening gives lucrative employment to a large number of families. Add to this the vast and important interest of forestry, and it is evident that the field is of sufficient magnitude to demand a general recognition more direct and positive than has been hitherto granted. The number of dollars returned to the producer for his fruit is no doubt with a very large class of men the only question. But there are not a few who hold that the sanitary interests of the home and the influence of the products of the orchard and garden upon the health of the family are matters of great importance. It would be a very narrow view of this subject that did not embrace under this general statement the moulding influence of horticulture upon our social life. The questions of art and pecuniary returns we are told do not go together. There are not a few who will tell us, You must ignore beauty if you demand profits. You must, they sagely tell us, ignore high social culture if you are to come down to the province of the mighty dollar. I incline to the belief that some make a very grave mistake here. It is only an unnatural view of what real beauty consists, that will lead us to this point. If we take the most cursory view of nature, we shall be impressed with the idea that under the hand of the All-Wise Architect profit and beauty are made to go together. And it

is, then, best to remember that the pursuit of horticulture, even in its higher sense, is financially profitable. The work of the horticulturist, combining on the one side the necessity for adequate pecuniary returns and on the other the perfection of art, becomes in the very nature of the case very wide in its range, and complicated in its character. The care of delicate flowers and the laying out and care of the garden with all its complicated appendages, the culture and training of orchards and forests, involves a multiplicity of details and a variety of work that will demand not only a varied experience, but an extended culture.

The aim of all education is to literally *call out* the latent powers of the mind. Among the varied pursuits of men, that which serves most to do this should rightfully hold a high place in the estimation of thoughtful men, and in this age should be given the first place in practical culture. In our ideas of what should constitute a perfected system of education, we shall probably be quite agreed that it should embrace the following particulars:

1. A well-developed physical nature.
2. Habits of close and discriminating observation.
3. A capacity to compare known truths in nature; to eliminate the false and hold fast the good.
4. To learn to love the beautiful, and to form notions of a correct taste which shall serve to elevate and purify.
5. And to form such views of the love and wisdom and benevolence of the Supreme Being as shall lead us to aspire to and labor for a higher life.

We see that, judged by this standard, much of our old system of education is faulty. In the first place, the physical nature has been almost entirely neglected. And what is regarded as the more complete culture not only neglects that culture, but so shapes its educational systems as to utterly ruin the physical. Witness the hundreds who come through our higher institutions physical wrecks. Especially is this the case with hosts of the young ladies who come out from what are termed our fashionable institutions of learning. The old system of culture is no doubt subject to criticisms in other directions; but it is not our object to dwell on the imperfections of the past, but to insist that there is a possibility of culture, broad and liberal in its character, while the student is every day in constant intercourse with nature.

We have wondered sometimes, when we have met men that have known little or nothing of the schools, and yet are so perfectly at home in everything relating to nature, how they became educated. Deprived, it may be, in early life, of all the privileges of the halls of learning, and pressed by accumulated cares, they have gone on year by year gathering up a rich storehouse of facts; and, ranging over nature's wide field, and in their own way, they have become thoroughly cultured. They are at home in the midst of nature. Their very life has been shaped to treasure up for use the great, good, and beautiful around them. It is the height of affectation to assume that such men are uncultured. They have become familiar with nature's highest and broadest culture, and in the development of art and the unfolding of science have been often most successful. Their lives have been familiar with nature, and they have gathered valuable lessons at every step. We always feel instructed when they write or speak to us.

Now this kind of culture has been successfully attained in horticultural pursuits more frequently than anywhere else. It is a culture that does not show the mildew of the schools. It is always fresh, and never musty with age. It has its bright and cheering side; gives a charm to domestic and especially to rural life. It throws a sprightliness and brightness over life that does not cease when men and women grow old; adds a charm to age, and mingles the perennial sunlight of love with the gray hairs. It is this that cheers, brightens and gladdens life.

We are sometimes told that horticulture is a higher or advanced department of agriculture. And perhaps this view is a correct one. It gives us the natural and reasonable view of the relation which the care of the garden, the conservatory and greenhouse, the park and the lawn, the orchard and the forest, should hold to the rougher and more masculine departments of agriculture. So we have a right to regard the educative influences that grow out of horticultural pursuits as of a higher order and having a wider range than those offered by any other occupation.

As a power, then, in a practical education, we claim for horticulture not simply a place, but the first place. We do not believe it, then, either the token of crankism or special favoritism, that would claim for horticulture a higher place in a practical education than many of the conservators of our educational interests have been willing to grant. If you would make man happy and prosperous, bring him in harmony with nature. Nothing can effect this object so certainly as an earnest devotion to the pursuits of horticulture.

As a society we are called upon to extend the field of observation and experiment. New problems present themselves each year, demanding intelligent solution. There are old questions yet unsettled; and because they are old they are none the less important. We would know not only what "blight" may be, but we desire most of all to know how to escape it. The best possible ways of destroying injurious insects, opens a wide field for investigation. We have open here a life-long work. Again, we find that certain varieties of apple trees—as for example the Winesap—are frequently decaying at the root, on the north and east sides. The extent of this injury is yet an open question; and the cause of it is not yet quite clear. The removal of the cause, or the cure for the injury, is yet an unsolved problem.

The extent to which fertilizers can be used on various soils, and the kinds of fertilizers that can be best used in fruit culture; and whether strong nitrogenous fertilizers can be profitably employed in small-fruit culture, is still a question offering many fields of inquiry.

Then, again, we may regard the possibilities of irrigation in garden and fruit culture as demanding special consideration. We shall have to settle the possibilities of water supply, and the extent to which it may be made profitably available.

Another matter demands our special consideration, in future as in the past, and that is to seek in every way to guard the citizens of the State against imposition at the hands of an innumerable host of impostors, who come to fleece the people, offering them no adequate return for their money. We hail with pleasure every honest effort for improvement. We are glad to second the efforts of the inventor who really offers us genuine improvements, whether he devises a better hoe or plow than hitherto offered the public, or brings out new and more valuable varieties of fruit. But we have no warm place for the class of men who systematically engage in swindling the people. It is the duty of this Society to watch well the action of this class of men, and to investigate and publish their actions. As a society we cannot, perhaps, always reach these evils, but as individual members, having the cause at heart, we may materially aid this work of crushing out genuine humbugs in our own localities. As a good example of what can and ought to be done, I take the liberty of referring to the bold utterances of one of our members in the local press of a southwestern county against the Russian apple "fiend." Such outspoken comments seem specially called for in many cases, and no doubt will serve to send the enterprising canvasser on to the next county. We are gratified to see the evidence that the members of this Society are ready to speak out, when the emergency calls for it, in defense of the interests of our people.

We know that all are liable to err, and hence we ought always to be cautious in passing judgment upon the claims of inventors and promulgators of new theories, as well as



new devices and machines. We must realize the fact that as time advances we shall be forced to consider, in one way or another, new inventions to remove the ills to which vegetable life is heir. The inventive genius of the age is at work in all the departments of our pursuit, and the success reached is often very gratifying. While the various inventions, discoveries and theories may all look well upon the surface, as a society it becomes us to proceed cautiously either in commending or condemning. New fruits are constantly pressing to the front. Some of these, no doubt, are valuable, and doubtless many of them will prove worthless. Some of them will be really new, and it is not improbable that old ones will come to the surface under new names. In regard to society action upon such matters, there is really only one safe line of action for us to pursue, and that is the conservative policy which has hitherto guided our action. We may encourage invention; we may listen candidly to the presentation of new theories; we may investigate whatever purport to be new discoveries in the various departments of horticulture; we can encourage in various ways the dissemination of new varieties of fruits. But while doing all this, it should be our special aim to induce individual investigation; and at the same time be sure and not promote speculation.

Let me urge, then, the importance of due and careful consideration of any new matter relating to horticulture, weighing it in all its bearings, and taking time to do this before we, as a society, attempt to give any answers which may involve State interest. I urge this with a special satisfaction, from the fact that the thought so well accords with the past action of the Society, and that what I have to say can only be regarded as pressing an adherence to what may be termed our settled policy.

There is still another matter which seems to demand emphatic notice, and to which our Secretary in his last report called special attention; and that is that the Society cannot be responsible for individual opinions expressed in our meetings, and reported in our transactions. This is a matter of more moment than we at first are inclined to believe. We have frequently met persons who have taken the utterances of individuals as the authoritative declarations of the Society. Our Secretary wishes it understood that every man speaks for himself on this floor, and his utterances go to the world upon his own authority, and not upon that of the Society.

The contemplated exposition at New Orleans, in view of what ought to be done in that direction by Kansas, should demand your consideration. If there is to be a grand display of Kansas fruit at New Orleans, the members of this Society and its auxiliaries will have much to do with it. Possibly, before the close of this meeting, your attention will be called specially to our relation to that exposition.

I ask, then, for no change in the policy of this Society. Let us adhere to the course which our past history marks out for us, by seeking to make every department of horticulture so far a success that in years to come Kansas may be counted as the GARDEN STATE OF THE NATION.

## MISCELLANEOUS CONTRIBUTIONS.

[NOTE.—These papers were prepared for the annual meeting, but were received too late to be read then.]

### HONEST TRAFFIC IN NURSERY STOCK AND HORTICULTURAL PRODUCTS.

BY J. W. BYRAM, CEDAR POINT.

"Honesty is the best policy" is an old and time-worn proverb, and is supposed to apply to every pursuit followed by man; and the presumption is, that he who makes this his standard of business will, in the end, be most successful. But an examination of the orchards, vineyards, and small fruits, now growing in Kansas, would seem to lead to the conclusion that in the business that heads this article, the proverb has been reversed, and would better read: "Deception and fraud are the surest road to financial success." True, twenty years ago the fruits best adapted to this soil and climate were not clearly determined, and much had to be learned by experiment. To do this, some of our most reliable fruit-growers experimented largely, at a pecuniary loss to themselves, in order that the coming settlers of this fast-growing State might have a sure foundation on which to build successful orchards, vineyards, and small-fruit plantations. The State Horticultural Society, though young in years, was practical in the extreme on this subject, and twice a year the fruit-growers of the State convened and compared notes, recording their success in some things and failure in others, and the Society gave these facts to the public, without partiality or prejudice, in the annual volume of transactions, which some of the old members will remember were published under great difficulty for want of funds. But for the past eight years, sufficient knowledge has been scattered throughout the State, of fruits adapted to the soil, that no man need to plant with uncertainty. Yet within this period, most of the frauds and humbugs of which farmers and tree-planters are now the victims, have been originated and palmed off on the confiding public.

During the Centennial exhibition of 1876 the possibilities of this State were so extensively advertised that it drew the attention of the entire Union. Thousands flocked here. Eager to realize the results foreshadowed by that exhibition, and ready to believe any plausible story told, they became the easy victims of unscrupulous dealers who hastened to the field already ripe for the harvest. The first that came under my notice were Eastern parties selling dwarf-apple and pear trees. Fully equipped for the purpose, agents were scattered over the State, showing that vast fortunes awaited the settlers who had nerve enough to invest largely in planting. The prices of their stock were, if possible, more extravagant than their stories. Orders were filled regardless of name, or quality, and a few years sufficed to show the victims that "fools and their money" had parted.

Following this came the grape swindle of 1878-9. The principal field of operation for swindlers of this class was in what is now the central portion of the State. Some Concord vineyards in the eastern portion of the State were said to be an immense success,

and this was followed by a troop of agents representing Eastern nurseries, either real or fictitious, with plates and samples of grapes so prolific, and of such high quality, that a few vines were a sure road to fortune. The price (in some instances \$5.00 per vine) was nothing compared to the profit to be derived from the fruit. Victims were numerous, and worthless vines on many farms still show the cost of the swindle. That this swindle met with a sudden check is largely due to the prompt action of the Secretary of the State Society. He, supported by leading fruit men, rapidly gathered such facts in regard to the fraud, and circulated them so widely, as to cause the agents to hastily retreat from the field.

But the most gigantic fraud, involving the largest amount of money, was what is now familiarly known as the "Russian-apple swindle." This scheme seems to have been well planned, and the State invaded in all the wealthiest portions at the same time. The contracts were as nearly "iron-clad" as possible; the stories, as usual, very smooth, showing that the stock would begin bearing at a very early age, would resist the severest winters, would bear *every year*, and live far beyond an ordinary lifetime; the fruit was of marvelous size and richness, and would sweep all native varieties out of the market where introduced. This and much more was offered to the customer at the moderate price of \$1 per tree. Agents carefully avoided fruit men, as they would at once recognize the names of such fruits as Red Astrachan, Duchess of Oldenburg, Tetofsky, Alexander, and others that could be bought in any nursery by the thousand at 8c. to 10c. each, and thus contracted many thousand dollars before the scheme became public. As soon as known, the State Society took the matter in hand through the Secretary, and in a short time the agents were compelled to fold up their plate books and contracts, and seek new fields of plunder. Although in each case where the buyers of this stock resisted payment no compulsion was used, yet many thousand dollars were paid for these trees by those who preferred to pay the order rather than risk a suit at law.

This is perhaps the last organized swindle of such magnitude in our State, but each year finds agents for Eastern nurseries of unknown responsibility selling stock through the State at prices far above our home dealers. Even the past season, while this Society was holding its semi-annual session at Junction City, the agents for an Illinois nursery were canvassing Davis and Dickinson counties, and their order books showed thousands of dollars' worth of stock, sold at prices from 10 to 50 per cent. above what any of our home dealers would have supplied stock of the same quality.

But a change is now being introduced. It seems evident that the supply of stock must be mainly through the agency of canvassers, and a majority of farmers and planters now demand of agents, references indorsed by responsible nurserymen as to the value and genuineness of the stock ordered, and such dealers are held responsible for their agents' acts. Realizing the importance of this course, many leading nurseries now give their regular agents a certificate of appointment, and it is common for the purchaser to demand credentials before giving an order. This Society may justly regard this reform as an outgrowth of its teachings since its organization, and one to which it may refer with conscious pride.

Having now reached a period in our horticultural history that our fruits are beginning to seek a market, permit me to urge the necessity of applying the rule of honesty in putting fruit on the market. It will not do to send barreled fruit to market with fine specimens at each end and inferior fruit in the center, nor small fruit in boxes with handsome "topping" and poor fruit underneath. Such a course will speedily bring the crop of the State under general condemnation, while an honest course of rejecting all unworthy fruit, and offering only the best, will insure highest prices as well as advance the general reputation of the State.

In this connection I would suggest that this Society commend the practice of some

dealers in branding all the fruit sold by them, thus assuming responsibility for its quality, and urge a general adoption of the rule.

I conclude as I began, that in selling and planting, as well as in marketing the fruit, "Honesty is the best policy."

## THE BENEFITS OF HORTICULTURAL MEETINGS.

BY CHAS. REYNOLDS, JUNCTION CITY.

Association is the impulse of nearly all progress. This has long been recognized as an unbiased truth, never to be doubted or questioned. But notwithstanding this well-recognized fact, time was, and the distance is not remote, when fruit-growers and horticulturists seldom met in conventions, clubs, or organized societies. Even in Great Britain, a nation of gardeners, and where the culture of the soil has for ages been brought to great perfection, association for combined benefit is comparatively modern. For 200 years after Judge Fitzherbert had written and published his *Agricultural and Horticultural Book*, it found few readers; caused, most likely, by the fact that isolation, not association, was the rule among all the tillers of the soil. It was many years after this before the English or Scotch gardeners attempted anything like combined effort to benefit their heaven-born calling. Blythe had written his book on *Horticulture and Agriculture*; Hartlib had left his legacy to the world; and Jethro Tull, the Berkshire blower, had blustered over his drill for at least twenty years before any attempt of uniting themselves into an organized society was made by British gardeners.

The first thing of the kind ever attempted, as far as I know, was done in Scotland in the year of our Lord 1723. Since that day clubs, boards and organized societies have been as numerous as the stars in heaven; and as useful to man as the same stars have ever been in guiding wayfarers to the haven where they would be. Those societies have taught that the primary law of man's nature leads to progress; that honest labor is a blessing. Carlyle tells us that "there is a perennial nobleness, and even sacredness, in work." Of course he does not mean by work, mere manual labor only, but every effort of the mind as well as the body. Man was born to labor. Without it, Paradise would have been past endurance. All growth of character, all noble energy, all true manhood, are the result of work. Biography tells us that when the Duke of Grafton reproached Lord Thurlow with his plebeian origin, that the noble lord vindicated his claim to his position by the industry which had placed him there, and hurled back the taunt by declaring that the peerage sought him, not he the peerage.

The first object of horticultural societies should be to dignify honest labor, and make it honorable. The second should be to make it *hopeful*; and this they will achieve by making known the success of those who have contended with difficulties and overcome them. All labor, says a late writer, should be intelligent. It has grown to be a maxim that always "near the hearing ear will be found the speaking voice." The idea that labor need not be intelligent; that it works better by being debased to the condition of brute force, is a relic of the Middle Ages, and forms no part of modern philosophy. All great improvements in modern science, in the arts, in horticulture, have been achieved by having an intelligent mind to impel the willing hand. And this intelligence is acquired by mind coming in contact with various active minds.

Horticultural labor must be a delight, to be truly valuable. The gardener, or fruit-grower, must go to his garden, or orchard, as the artist goes to his studio. Horticultural gatherings have done much to disabuse the common mind of the advantages of quantity

rather than quality. Large fields have been tormented, amid much fretting, to yield a poor crop. Science and labor well applied will, I am sure, double the quantity of the crop on nearly every acre tilled in this State. In many instances it has already been doubled, and this Society should receive the praise. As a nation, we have run mad in our rage for more land. It matters not how much we have, we want more.

Dr. Bohrer told us in December, 1877, that "patience, observation and industry have taught many of our first settlers that to be successful in the different departments of horticulture peculiar to this latitude, requires a correct knowledge of how to cultivate, what to cultivate, and when to cultivate." Many persons have located on our prairies, coming from our older States—and I may say, and correctly, too, that they have come from every part of the civilized world—and have prepared the soil in their accustomed manner; planted, what to them, in the respective regions of country of which they had formerly been residents, were known to be the best and hardest varieties of the different fruits, and have suffered most disastrous failure. It is scarcely necessary to state that the totally uninformed, the restless and dilatory, have met with failure here, as such is their history everywhere. But it is the industrious, the attentive, and the informed, whose efforts have been foiled, as well as those of the foregoing class.

But through what medium have the facts and conclusions which have benefited us all, been reached? Mainly through horticultural societies—*mainly through this State Society*. The horticulturist is taught, in all the meetings of this Society, that he is not only a working, but a thinking being; that he is to seek and comprehend the principles of his occupation; that he must rise above his occupation as an *art*, and study it as a *science*. I hold, and you fully agree with me in this, that the horticulturist should have a reason for the methods he adopts, as much as the mathematician; and should be able to give an explanation of the problem he solves. I am no believer in *theory*, or in *practice*, operating independently of each other. Book-gardening and hard work, undirected by such knowledge as this Society imparts, seldom work success. To what shall I liken the unskilled horticulturist? To Prometheus, with the properties of a giant—but to Prometheus *bound*. This Society has given its consent to the marriage of theory and practice—book-learning and back-aching, but is opposed to divorce, and for this I honor it. It fosters a taste for the beautiful. It paints the dwellings and outbuildings in tints that blend, and it adorns the dooryard with flowering shrubs and evergreens, and the highway with maples or elms.

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## HORTICULTURE IN THE NORTHWEST.

BY E. A. TAYLOR, BELOIT.

Horticulture in the northwestern portion of Kansas has been very similar to what horticulture was the first ten years in northeastern Kansas, namely, ten failures to one success; and these results are the products of very similar causes, namely, the untamed condition of the soil; difficulty of getting trees with unimpaired vitality; tree-planter's lack of knowledge as to varieties suited to the peculiarities of his peculiar locality; a great lack of both practical and theoretical knowledge of how to properly plant, and after-care of the trees; in some cases criminal negligence by many of the few who knew how, but would not give the trees proper attention; and in many cases ignorance and shiftlessness combined in the same individual; and I may safely add, occasional if not frequent drouths and hot winds have appeared upon the scene, causing grief and despair

in the horticultural family as completely as did the works of that terrible "bad boy" in the household of the Peck family.

Similar to all new-country settlers, most of us had to "cut and try"—cut again and try again, learning in the tedious and undisciplined school of experience. To be sure, the State Horticultural Society has done much toward imparting information, and to its teachings are due the majority of successes which now exist in the fruit-growing fields of northwestern Kansas; and right here I wish to add, if there had been twice the number of our State Horticultural Reports distributed in what may be termed "New Kansas," we would now have twice the number of satisfactory orchards within our district. It seems strange that when our legislators are so zealous and liberal in granting appropriations for the building and maintenance of so many imposing colleges and universities for the instruction of the young of to-day, and those yet unborn, that they should resort to the cross-roads politician buncombe, "retrenchment, and cut down appropriations," when the appropriation bill of our State Horticultural Society comes up. Is not the diffusion of practical knowledge among the oarsmen who are to-day propelling the great ship of state as much a matter of justice in policy and downright common sense? I did not get off on this appropriation business thinking I had exhausted the subject in hand, but to yield to my natural impulse to "*speak right out in meeting*" when politicians electioneer for the right but act on the wrong side in the Legislature, if elected to the office.

Now as to the lessons of 1884. We must say they have been very satisfactory, because it has been, in a general way, a good fruit year. Very many had despaired of ever picking an apple from one of their own trees in Kansas, who this year gathered fine specimens, and in some cases bushels of them, and are now going to take good care of what few neglected trees they have left, and plant more. Again, that class which are found everywhere else are here also, namely, those who stand back and wait for their neighbors to experiment and break the road for them to follow. This class are now on the move, and by force of instinct will plant and cultivate. So we now confidently anticipate that northwestern Kansas will demonstrate, within the next few years, horticultural achievements equaled by few and excelled by no other section of the State.

## ANTIQUITY OF THE ROSE.

BY SAMUEL REYNOLDS, LAWRENCE.

The all-wise Creator has kindly furnished us with a great variety of objects for our pleasure and gratification, as well as with life itself. The earth teems with natural beauty, as well as natural bounty, through which life is made not only endurable, but enjoyable. Among the many pleasing objects surrounding us may be mentioned the wonderful variety of flowers which bedeck and beautify the earth; among which the rose stands preëminent for its beauty, fragrance, and its charms; and has universally received the regal title of Queen of Flowers. It is the ornament and charm of both cottage and palace. It is the symbol of love, beauty, and innocence; and has furnished poets with more allusions and comparisons than all other flowers. In the old countries of the world it has been admired and cultivated for ages; nor does time seem to weaken man's love for this favorite flower; nor to lessen his devices for rearing it in perfection. It may therefore be of some interest to know something of the history and antiquity of the rose; and to learn the origin of some of those allusions to it with which our literature abounds.

Until the beginning of the present century, but few sorts of roses appear to have been cultivated in Europe; but since then a great number of beautiful varieties have been raised from seed, on the continent, chiefly in France, however. Several hundred new varieties have been raised in England, swelling up the catalogue to over a thousand names. Many varieties, however, in this vast list are so nearly alike that they can only be distinguished by a professional cultivator.

The rose in its wild state always exhibits a single flower; it is to culture, and the devices of the florist, that we owe our present stock of exuberant and variegated blossoms. The rose is mentioned by the earliest writers of antiquity as an object of culture. Herodotus speaks of the double rose, and Solomon of the rose of Sharon, and of the plantations of roses at Jericho. Pliny mentions several sorts of roses which were known to the Romans, and which modern authors consider as the same with the Damascus, French, and cabbage roses. By the Romans, roses were more highly prized than any other flowers. In the reign of Domitian, the Egyptians thought of offering to the Emperor's court, as a choice present, roses in winter; but this the Romans smiled at, so abundant were roses at that season; for they had learned the art of forcing. "In every street," says Martial, "the odor of spring is breathed, and garlands of roses, freshly gathered, are displayed." Said the Romans, "Send us corn, Egyptians, and we will send you roses."

Roses were employed, both by the Greeks and Romans, to decorate tombs; and instances are given of rose gardens being cultivated for the express purpose of furnishing flowers with which to decorate graves.

Very little is known of the history of the rose from the time of the Romans till the days of Tournefort, when botany became a science. That roses were held in esteem, in the dark ages, by all who could procure them, there is no doubt. When Saladin took Jerusalem, in 1123, he would not enter the shrine of the temple, then converted into a church by the Christians, till the walls had been thoroughly washed and purified with rose-water. Voltaire says that after the taking of Constantinople by Mahomet, in 1453, the church of Sophia was washed with rose-water, in a similar manner, before it was converted into a mosque. We read in the History of the Mogul Empire, by Father Catron, that the celebrated Princess Nourmahal filled an entire canal with rose-water, upon which she was in the habit of sailing with the great Mogul. The heat of the sun disengaged the essential oil from the rose-water. This was observed floating upon the surface, and thus was made the discovery of the essence, *attar of roses*. Sir John Chardin, in 1686, found the gardens of the Persians filled with roses; and all modern travelers bear testimony of the esteem in which this flower is held in Persia, Syria, and Egypt. Sir W. Ousley says that he was perfectly overwhelmed with roses in the garden of the castle of Fassa. Jackson speaks of mattresses being made of the roses of the Nile, for men of rank to recline on. Buckingham mentions the rose plantations of Syria as occupying many acres in extent. At marriages, and on other festivities, in the middle ages, the guests were adorned with roses; it was also customary to carry large vessels of rose-water to baptisms. Indeed the fondness for this fragrant and elegant flower, by our ancestors, explains the feudal custom of vassals being required to pay so many bushels of roses to their lords.

In Britain, one of the earliest notices of the rose occurs in Chaucer, who wrote early in the thirteenth century. In the beginning of the fifteenth century there is evidence of the rose having been cultivated for commercial purposes, and of the water distilled from it being used to give a flavor to a variety of dishes, and to wash the hands at meals—a custom which is said to be still preserved in many of the public halls within the city of London. Among the New Year's gifts presented to Queen Mary, in 1556, was a bottle of rose-water. Among the items of a dinner of Lord Leycester, when he was Chan-

cellor of Oxford University, in 1570, is mentioned three ounces of the same liquid. In 1576 the tenant of Ely House covenants to pay the Bishop, on Midsummer-day, a red rose for the gate-house and garden; and for the grounds ten loads of hay and £10 per annum; the Bishop reserving to himself and successors free access through the gate-house, for walking in the garden and gathering twenty bushels of roses yearly.

Gerard, in 1597, speaks of the damask rose, and the cinnamon rose, as being common in English gardens. The musk rose is said to have been brought from Italy into England, in 1592; the single yellow rose from Syria, in 1629, and the moss rose from Holland early in the eighteenth century. One of the most valuable roses—the China rose—was introduced in 1789; and it may be said to have created a revolution in the culture of roses by the innumerable varieties which have been raised between it and the European roses.

The great use of the cultivated rose in all countries where it is largely grown, is as a floriferous shrub, but nevertheless it is grown for the uses to which its flowers are applied in medicine and domestic economy in different parts of Europe, in the north of Africa, and more especially in Asia. In Syria it has been cultivated from time immemorial, and that country at one time received the appellation of the “land of roses.”

The rose plantations of Damascus, Cashmere, and Fayoun, in upper Egypt, are cultivated solely for the making of the essence of roses. In France the *Rose de Provins* is extensively cultivated in the neighborhood of the town of that name, about 60 miles southeast of Paris, for similar products. In Great Britain, in the neighborhood of London, Edinburgh, and many other large towns, as also in many private gardens, the flowers are gathered for making rose-water, or drying as perfumes. In Syria the natives convert the leaves and flowers into cakes and tarts; and at Damascus the young shoots are gathered and eaten as vegetables.

The poetical, mythological and legendary allusions to the rose are exceedingly numerous in every country where it is known. It was dedicated by the Greeks to Aurora, as an emblem of youth, from its freshness and reviving fragrance; to Venus, as an emblem of love and beauty from the elegance of its flowers; and to Cupid, as an emblem of danger from the fleeting nature of its charms, and the wounds inflicted by its thorns. In the Eastern world the rose has always been a favorite with the poets; and volumes of fable and allusion might be gathered from their works.

By the Church of Rome the rose has always been considered a mystical emblem. It enters into the composition of all the ornaments of this church, in combination with the cross. The rosary used in devotional exercises is said to be made of beads manufactured in the following manner: Rose leaves contain certain acids which act on iron, and advantage is taken of this property by beating the petals of the flowers with cloves and other spices in an iron mortar till a thick, black paste is formed, which hardens on exposure to the air, and is there polished, or turned so as to form the perfumed beads of the rosary.

In the Middle Ages the knights at a tournament wore a rose embroidered on their sleeves, as an emblem that gentleness should accompany courage, and that beauty was the reward of valor.

The French Parliament formerly had a day of ceremony called *Baillée de Roses*, because a great quantity of roses were then distributed. The nobles were then accustomed to receive from their vassals their annual tribute of roses; and then to interchange and make presents of them to each other.

The rose is the national badge of England, but the origin of its assumption is not clearly explained by any of the old writers. Shakspeare derives the assumption of the red and white roses by the rival houses of York and Lancaster, from a quarrel in the Temple gardens, between the Duke of York and the Earl of Somerset, the partisan of



Henry of Lancaster. Finding that their voices were getting too loud, the Duke of York proposes that they shall

"In dumb significance proclaim their thoughts;"

adding:

"Let him who is a true-born gentleman,  
And stands upon the honor of his birth,  
If he supposes I have pleaded truth,  
From off this brier pluck a white rose with me."

To which Somerset replies:

"Let him who is no coward, nor no flatterer,  
But dare maintain the party of the truth,  
Pluck a red rose from off this thorn with me."

Their respective followers gathered the different-colored roses, and tradition says these flowers were adopted as the badges of the houses of York and Lancaster. The York-and-Lancaster rose, which has one-half of the flower red and the other half white, was named in commemoration of the union of the two houses by the marriage of Henry VII of Lancaster with Elizabeth of York.

The expression "under the rose," or "*sub rosa*," took its origin, says Jenoway, from the wars between the houses of York and Lancaster. The parties respectively swore by the *red* or the *white* rose; and these opposite emblems were displayed as the signs of two taverns, one of which was by the side of and the other opposite to the Parliament house, in Old Palace Yard, Westminster. At these taverns the respective parties were accustomed to meet for plans, defensive and offensive; and every transaction was said to be done "under the rose," that is, in profound secrecy; and nothing said under the rose was allowed to be repeated.

According to others, this term originated in the fable of Cupid giving the rose to Harpocrates, the God of Silence, as a bribe to prevent him from betraying the amours of Venus, and was hence adopted as the emblem of silence. The rose was, for this reason, frequently sculptured on the ceiling of drinking and feasting-rooms, as a warning to the guests that what was said in moments of conviviality should not be repeated; from which, what was intended to be kept secret was said to be held "under the rose."

Anacreon makes the birth of the rose coëqual with that of Venus and Minerva.

"Then, then in strange, eventful hour,  
The earth produced an infant flower,  
Which sprang with blushing tinctures drest,  
And wantoned o'er its parent breast.  
The gods beheld this brilliant birth,  
And hailed the rose—the boon of earth."

## HORTICULTURE IN THE ARKANSAS VALLEY—LESSONS OF 1884.

BY J. B. SCHLICHTER, STERLING.

In this report I am to give the lessons of 1884. The field assigned is the Arkansas Valley. But with my limited means for observation, I claim that I am not competent to embrace so large a territory in this paper.

Rice county may properly be called the mean of the two extremes of this great valley. It is an average western county, as pertains to agriculture and horticulture.

As we go westward, we approach a line where general farming and fruit-growing

must fail for lack of moisture. As we near this line, the more doubtful the results. Just where this line is, as yet remains unsettled. It is claimed by some that a line drawn about the center of Phillips county, on the north, and Harper county, on the south, will about indicate the points beyond which general farming will fail for want of seasonable rains. Such a line will throw a portion of Barton county into that region.

The facts in the case are these: that heretofore the farmers of Barton county have found it more difficult to raise corn than those in Rice county. On the other hand, the farmers of Rice and Reno counties have encountered more difficulties in growing general farm crops than those of McPherson, Harvey, and Sedgwick.

What is true in agriculture is true in horticulture. The success of Rice county over Barton in the matter of growing trees is apparent, and over Pawnee county still more so. Therefore we may say that Rice county is an average western county, and is east of that fatal line.

The lessons of 1884 prove that we may safely venture in horticultural pursuits in Rice and adjoining counties.

I. One of the lessons of 1884 is, that success is sure to attend the slow and careful experimenter. "This lesson has been learned long ago," says one. But we in southwestern Kansas had to learn it once again. To go forward and purchase the same varieties, and plant, prune, and treat them in general as we used to in the East, would be attended with a more or less degree of failure. Nor did we dare to rely fully upon the experience of the fruit-growers of eastern Kansas. Some things that succeed in eastern Kansas fail with us. We could not go to the books and ask them what to do, for there were none written about horticulture in southwestern Kansas. Nobody had ever raised an apple in all that region, and how could we tell whether ever one could be grown? Indeed, the testimony was all against us. Men came here, brought with them fruit trees and shrubs of almost every description; and before they did anything else, they set out their orchards and filled their yards with all kinds of shrubs, bulbs, and flowers.

In 1872, I planted apples, peaches, pears, cherries, currants, gooseberries, raspberries, blackberries, grapes, etc., in newly-broken ground. Except a lone apple tree and a lone peach, these were soon all dead and forgotten. This veteran apple tree, a Red Astrachan, and the old scrawny peach, are still alive, and beginning to do well. They have borne their first crop of fruit the past season—twelve years after planting. They are old pioneers, have passed through all the vicissitudes of a frontier life, defied the teeth of the grasshoppers, and now are ready and willing to furnish cions or buds to any who may desire to propagate a generation of venerable fruit trees.

In 1873 I filled out my ground again, and made some additional plantations; and in 1874 planted quite largely of apple and peach, and again lost nearly thirty per cent. by the grasshopper scourge. Others did as I did, and lost as I lost. That was quite comforting: for misery finds comfort in its own company. Therefore, I say, the testimony was against us. Many said—and we were half persuaded of the truth of it—that we never could raise fruit in Rice county. But some of us who came to stay were determined to "hold the fort," and went on, singing "Try, try again." We moved slowly and modestly, "Line upon line, precept upon precept;" "here a little, and there a little."

Of apples, we only planted such as we knew had succeeded in eastern Kansas. Of peaches, we planted seed and raised seedlings, budding a few. Of grapes, we planted Concord; of cherries, common Morello and Early Richmond, on their own roots—because we could get a few of these cheaply, and then raise our own trees from sprouts that would come up.

Of forest trees, we planted cottonwood, mostly; because we could raise these from cuttings. Some of us planted a few walnuts; and some, Sandhill plums.

Now, ten years after the grasshopper scourge, we can say positively that apples will

grow in Rice county. We can also begin to recommend what varieties to plant. Those who have looked on, and waited to see if apples could be raised in Rice county, before they would plant trees, now see their mistake. But all our work was an experiment, not only with the apple, but with all other kinds. We went forward, not knowing which would prosper—this, or that—or whether any of it would. We planted in the morning, and in the evening withheld not our hand. But now it is different. We know what we are doing, and it is no guesswork.

II. Another lesson of 1884 is, that no specialist can hope for success. By a specialist in horticulture, we mean one who devotes his time to cultivating one thing, be it apples, or peaches, or plums, or pears, or one or the other of the small fruits. In southwestern Kansas specialties will not be remunerative. As on the farm, so in the orchard and garden: variety is the road to success. In fact, it is a question with us whether exclusive fruit-growing can be made sufficiently remunerative to make it a profitable business. It is safer to have a sufficient tract of land that one may raise corn, potatoes, cabbage; feed hogs and cattle, keep chickens, and sell butter, eggs, and pork. In the line of fruits, one must confine himself to leading sorts. The apple orchard must be the principal. It is perhaps still a question whether apples, or any other kind of fruit, can be made profitable in western Kansas. Our country is yet too new and untried. We have no means as yet to calculate how frequent will be the failures. But it has been sufficiently demonstrated that we may plant more largely of apple, than of other kinds. After twelve years of experience in peach growing, I believe it to be more profitable to grow peach trees for fuel than for fruit. Of plums, one may plant largely of the native Sandhill variety. They are productive, hardy, and improve by cultivation. A moderate planting of the leading varieties of pears will be safe. Grapes succeed as well here as in any of the Eastern States, with less tendency to rot. Cherries, raspberries, blackberries and gooseberries may not always be remunerative for marketing purposes; but every family that have spare ground should plant sufficient for their own family use. The strawberry can be successfully grown by irrigation. The windmill that pumps water for the farmer's stock will, with proper contrivances, also irrigate a small strawberry bed that will furnish nice berries for the family. The varieties best adapted for this section are Charles Downing, Crescent, and Glendale.

III. Another lesson of 1884 is, that we can have an uninterrupted succession of fruit crops, from the first ripening strawberry until the last apple is harvested. On our grounds we commenced this season to market our gooseberries before our strawberries were all gathered. The former were sold at 10 cents per quart, the latter at 25 cents per box. Before the gooseberries were gone, we began to pick Early Richmond cherries; then followed the common Morello cherry, the mulberries, raspberries and blackberries in quick succession; and at the same time we were picking Amaden peaches, Rocky Mountain cherries, and Sandhill plums. Our earliest Sandhill plums ripen with the first picking of blackberries, and continue in season until the last of September. During this time we gathered our grapes and peaches, and were enjoying a taste of good apples during the entire apple season, besides storing some away for winter use.

IV. Another lesson of 1884 is, that some of the insect tribes that molest the fruit in older communities are also coming here. Our apples, plums, cherries and peaches were more or less wormy the past season. The plum-gouger has attacked the Sandhill plums for two seasons, and the past season it has been particularly destructive. The tree cricket is beginning to work; it has been noticeable for two seasons; its work can be seen on the cherry tree, willows, grape vines, and raspberry canes.

V. Another lesson of 1884 is, that birds are becoming destructive to fruit, more particularly to our apple and grape crop. Of the apples, the Ben Davis suffered the most,

the birds beginning their work when the apple commenced to color. The blue-jay, oriole and robin seem to be the birds that do the mischief.

VI. Another lesson of 1884 is, that the fruit problem of this belt is now fully settled. That is, we are no more in doubt now as to whether horticultural pursuits will succeed here. As to how profitable it will be, is still a question, especially with the apple. Our hot, dry and windy weather is against us. It causes many windfalls, premature ripening, and injures their keeping qualities. But there is a manifest change in this respect in our seasons since our first settlement in this country. Our rains are more seasonable, winds more moderate, and temperature more uniform.

With these lessons now before us, there is a general confidence now prevailing that has not been noticeable heretofore. People are planting, with a fair degree of certainty that if they give their orchards and gardens care and good cultivation, they will surely reap a reward.

# REPORTS OF STANDING COMMITTEES, 1884.

## ENTOMOLOGY.

BY A. N. GODFREY, MADISON.

Your committee has labored under great disadvantage during the season just past. Living outside of the region infested with the canker worm, or other serious insect enemy, we were unable to make any personal observations or experiments upon them. We have received no aid in our work this year from the fruit-growers of the State, except an interesting communication from Mr. Wellhouse, Fairmount, which is given in full.

The report of this committee should be general in its character, embracing many localities throughout the State. This can only be accomplished by travel and expense on the part of your chairman, or a system of correspondence with observers in different parts of the country. It should be the duty of all who attempt a battle with our insect foes, to give the results of their experience to the Society, through its Secretary, or the chairman of this committee. Nothing could be more valuable to our fruit interests than a concise statement of the means employed and the results obtained in experiments made by the fruit-grower himself. The question to be answered, with him, is not, "Will this method kill?" but rather, "Will it pay?"

FLAT-HEADED APPLE-TREE BORER — *Chrysobothris femoralis*.  
(Order, *Coleoptera*; Family, *Buprestidae*.)

The report upon the flat-headed apple tree borer is based chiefly on the answers received from circulars issued last year.

**CHARACTERS.**—This beetle is flattened, greenish-black or bronze above, and coppery or brassy beneath. It may often be seen on bright summer days, basking in the sun, when it is very active and difficult to capture; but on cool, cloudy days, it is more sluggish, and easily caught. The larva has a very broad, flat head, the tail narrow and generally curled around toward the head. It makes a flattened or elliptical burrow, and lives in the tree a part of two years.



Larva.



Beetle.

This insect is of very general distribution throughout the State, and seems to be present wherever apple trees are planted. It breeds in many of our native forest trees, and will probably always be with us.

Like many injurious insects, its work is most destructive during hot, dry seasons, when growth is weakened, and the flow of sap checked. In some localities, the loss occasioned by it is very great. H. E. Van Deman estimates its injuries "as equal to twenty-five per cent. of the trees in our orchards." L. A. Simmons writes that "it has destroyed many thousands of trees, the year they were planted." G. W. Ashby calls it "the terror of

the orchardist." Many others mention it as being very destructive to young or neglected orchards.

Trees which have been checked in their growth by injury, transplanting, or neglect, are especially liable to attack. The first two or three years after transplanting is the period of greatest danger. After the trees have resumed a rapid, vigorous growth, they are comparatively free from attack, as long as they can be kept in this condition. The beetle is very partial to such parts of the tree as have been bruised, or peeled, or especially where injured by "sun-scald," though, as Mr. Van Deman asserts, they are sometimes found in the healthy parts of both old and young trees. It is a well-established fact, however, that any remedy which will prevent sun-scald, will tend greatly toward keeping the borer in check. For this purpose, the trees should be leaned ten or fifteen degrees toward the S. S. W., at time of planting, and the trunks wrapped with straw, coarse hay, cloth, or other material, until the top forms sufficient shade to protect the body from the direct rays of the two-o'clock sun.

As a preventive measure against the borer, there is nothing better than thorough cultivation, keeping the trees in a state of healthy, vigorous growth. Care should be exercised in transplanting, to check the growth as little as possible.

The beetle deposits its eggs in crevices of the bark, during the months of June and July, and perhaps well into August. In September the young larva has entered the bark, and continues for some time feeding just beneath the surface, leaving a flattened burrow filled with its sawdust-like castings. A single borer may often completely girdle a young tree. By examining the trees in September, or October, the presence of the borer can generally be detected by the discolored patches of dead bark beneath which it is at work. It may then be easily removed with a knife, without additional injury to the tree. If undisturbed, the larva enters the hard wood to complete its growth, when it is very difficult to reach. Some recommend probing with a soft wire, while others pour coal oil or hot water into the burrow. Just before transforming to the pupa state, it gnaws its way outward, nearly through the bark, and then retires to the interior. Through this passage-way, so thoughtfully provided beforehand, it issues as the perfect beetle in June and July, ready to begin anew its work of destruction.

It is well known that alkaline washes are repulsive to this beetle, and it seldom deposits eggs on trees so treated.

A wash made of soft soap reduced to the consistence of cream by the addition of a solution of soda, lime, or concentrated lye, is highly recommended. This should be applied to the trunk and principal branches three or four times during the months of June and July.

In order that a better idea may be obtained of the remedies used against the borer, we quote from our correspondents the following methods which have been tried with success:

H. E. Van Deman: "Soaping in May and June; digging out with knife in August, and until cold weather."

Hogue & Mentch: "Thorough cultivation, and a wash composed of 20 pounds wood ashes, 2 pounds tobacco, 2 pounds soft soap, 2 pounds salt, and 4 gallons water, to be applied last of May and first of August."

S. Hatch: "The best remedy is to keep your trees healthy, if possible. A wash of strong lye-water—as strong as the bark will bear without injury, will destroy the newly-laid eggs, or the young worm. I have used a wash strongly impregnated with carbolic acid, and found it beneficial in many ways as a remedy against this insect, and other injurious insects also.

A. H. Griesa: "Keep the tree washed with soft soap; or make a paste of rye flour, and add sulphur and a little crude carbolic acid, to be applied with a brush, or swab."

J. W. Robson: "The best preventives are wrapping the stems of newly-planted trees with hay bands, long grass, split corn stalks, cloth bands, paper, &c. Every stem of the apple trees should be washed with soft soap after planting, and then bound up with some material."

Hiram Ward: "My remedy is strong lye soap reduced to the thickness of heavy paint by adding water, then apply to the trunks of the trees with a broom or scrub brush, thoroughly covering the body. This should be applied twice a year, in May and June, some thirty days apart. Keep the trees in thrifty growth. If the soil is not good, give the trees a heavy coat of coarse manure for four feet each way from the body of the tree."

Prof. E. A. Popenoe: "Keep the trees in health by careful handling and good cultivation. Cut out the borers."

L. A. Simmons, in an article in the *Wellington Democrat*, says: "Here in southern Kansas, where so much damage is done our trees by sun-scald, it would seem that a good coat of whitewash, made of freshly-slacked lime, might be of great benefit in relieving from the effect of summer heat, as well as guarding against the horticulturist's terror, the borer."

### CANKER WORM.

The following communication was sent to the committee by F. Wellhouse, of Leavenworth county. It contains many valuable suggestions to those contemplating the use of London purple:

FAIRMOUNT, KAS., May 16, 1884.

A. N. GODFREY—*Dear Sir*: Last year I wrote you that we tried London purple for destroying canker worm, as an experiment, and that we intended using it largely this year. We have been troubled with this worm for a number of years on 35 or 40 acres of our orchard; and last year they stripped every leaf from about 15 acres, then the fruit, and finally commenced on the bark. After their disappearance the trees again leaved out, but made a stunted, feeble growth, and I am very sure they would have finished them this spring if we had not interfered, as they hatched out by the million again, and every leaf seemed to be covered with them.

We ordered three barrels of London purple last winter, and had it in readiness. It comes in barrels containing about 200 pounds each; we received it from Humphrey & Davis, druggists, in Leavenworth, and it cost us 8½ cents per pound, laid down. We then made a tank eight feet long, three feet wide, and twenty inches deep. The sides and ends are made of two-inch pine, the top and bottom covered with No. 16 sheet iron. This tank was set on a wagon in place of a wagon-box. On this tank we put two rotary pumps, made by the Goulds Manufacturing Co. at Seneca, New York. It is simple and strong; throws a steady, constant stream, needs no air chamber, and works with but little friction. We then made another tank, 6 feet square and 20 inches deep, open at top. This tank was used to mix the purple with water. Inside of this tank we set a box, 2 feet square and 8 inches deep, with wire-cloth (12 wires to the inch) nailed to the bottom. This makes a sieve through which all the liquid should be run, so that the nozzle of the pump will not get choked. Then with a team and scraper we made a dam across a ravine in the orchard, which soon filled with water; set our mixing tank by the side of the dam, and one of the barrels of London purple alongside, knocked in the head, and poured in onto the purple as much water as the barrel would hold, and let it soak; and in a few hours poured in more water. This is to saturate the purple with water, so it will not fly about while handling. It is a very fine powder, and if handled while dry flies over everything, and is very injurious to inhale. We now took two large tin pails, cut off the balls, and punched a hole on each side, just under the rim; through these holes inserted a fork-handle, thus making a large dipper.

We were now ready for business, and on the 5th day of this month, when the canker worms had all hatched out and commenced their work on the leaves, we began spraying the trees with a mixture of about one pound of the purple to fifty gallons of water; but we soon found that this was not killing the worms fast enough, and so increased the purple until the liquid was a blood-red color, (in fact, we made it about as strong as the purple would make it,) and went over the infested part of the orchard three times with this strong solution, apparently completely saturating the foliage each time. It took us about five days to do the entire work.

Now as to results. At this date, May 16th, it looks as if we had killed every canker worm in the field, and many who have examined the trees so report; but I have looked closely, and find many still alive. I fear, that with all the pains we may take, we cannot entirely destroy them, and that, like the round-headed borer, they have "come to stay." Yet I am satisfied with the results; we have so nearly

exterminated them that it will take them years to increase so as to do us damage, and perhaps the birds and other enemies may hold them in check.

I would say that two pumps are not needed. We tried to spray two rows at a time by driving midway between, but found the distance too far off to do good work. The tank on the wagon we found too heavy, requiring four horses to haul it. Yours truly, F. WELLHOUSE.

#### THE APPLE-TREE ROOT LOUSE (*Eriosonia pyri*)

Is becoming quite numerous with us, both in the nursery and orchard. Seedlings taken up a few days ago were badly infested with them. It was noticed that they were exceedingly numerous where the young trees were crowded in the rows, but where more space was given, and a stronger growth made, they were seldom found. Young nursery trees, so infested, are unfit for sale, and should be destroyed by burning. Where this pest is numerous in the nursery, the rows should be well mulched, which will cause the insect to approach the surface. The mulching may then be removed, and the ground thoroughly drenched with boiling water. Another remedy, which is better adapted to orchard trees, and would probably succeed in the nursery, is to apply a plentiful dressing of unleached wood ashes over the roots infested.

If young trees are received from the nursery with this insect upon the roots, they should be dipped into lye-water before planting, or better, perhaps, be thrown on the brush-heap, and "cremated" at once.

#### THE CABBAGE FLEA BEETLE.

Gardeners are frequently troubled, in raising cabbage-plants in the open air, on account of this little pest, which eats small holes in the seed leaves, or stem, causing it to wither and die. After three or four stem leaves appear, the danger is past. We saved all our plants by sprinkling with whitewash made of lime and water, applied with a small brush-broom. No injury was manifest after the first application.

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### THREE INSECTICIDES OF GENERAL VALUE.

BY E. A. POPENOE, KANSAS STATE AGRICULTURAL COLLEGE.

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The most encouraging indications of progress in the field of economic entomology, in the last few years, are seen in the increased experiment with and investigation into the use and methods of application of insecticides. Promising results have already been attained by the use, in various forms and by various modes, of dilution of kerosene, pyrethrum, and arsenic, especially, and other substances in less prominent use. In the case of some insects, the ultimatum of success seems to have been attained; in case of others, owing to one or another circumstance, this end has yet to be reached, though success may be almost in view.

No need to dwell, before this body of fruit-growers, upon the desirability of continued and studious experiment in this direction. We are all, morally as well as financially, interested in the outcome. Fruit culture, whose virtues as a healthful, ennobling pursuit have been sung from earliest to latest times, will owe much of its attractiveness to one's ability to receive a portion of its rewards, and ordinary mortals are not satisfied with any portion less than the whole. When called upon to divide with the insects the results of his labors, he is loth to accept their draft upon his proceeds; and who will blame him?

But to return to our topic. One of the most desirable insecticides for experiment is pyrethrum, or Persian insect powder, or buhach, as it is variously called. I say desirable,



because it has proven efficacious in many special cases, and doubtless will in others, and the entire absence of danger to plants and to the superior animals attendant upon its use, is a very important point in its favor. Its use is, however, limited to certain classes of insects, being wholly powerless when applied to others. The action of pyrethrum upon susceptible insects has been described as producing a paralysis from which, in most cases, they do not recover, death usually following within a few hours after the application. "A small quantity of it, diffused in a close room by means of the bellows made for the purpose, acts very quickly upon flies, by bringing them to the floor, struggling upon their backs. They are unable to fly, and if placed upon their legs, are incapable of using them in locomotion." \* They may remain in this condition a day or two before dying. Miss Mary E. Murtfeldt states † that she procured immunity from aphides, scale, and mealy-bug, for her house plants, by but two dustings during the winter. Our limited experience with this powder in the College greenhouses has not corroborated this testimony, though some doubt as to the freshness of the powder used detracts from the value of our experiments. Pyrethrum so soon deteriorates from exposure, that great importance attaches to the securing of that which is known to be fresh.

To illustrate other uses of this article, I will quote from the *American Entomologist*, 1880, p. 178: "Adjacent to my office is a warehouse filled with wheat. This spring the grain weevils therein commenced to migrate, and infested my premises. We therefore sprinkled some buhach, or insect powder, over the grain, and swept the weevils up literally by the quart. Those which emigrated to my office were treated with a sprinkling, and it cut short their earthly career. . . . A clergyman, a friend of mine, who cannot sleep if a mosquito is within a mile of him, tells me he has only to put a little powder upon some burning paper in his room, and there is 'perfect peace.'"

Pyrethrum may be applied in different forms, to suit the requirements of the special case. It is often used as a dry powder, blown or sprinkled over the object, or in the air of a closed space, to be rid of insects. It may also be employed in solution in water. Professor A. J. Cook reports ‡ the application of simple mixtures of pyrethrum in water, at the rate of a tablespoonful of powder to one, or two, gallons of water. This solution was sprinkled over cabbages by means of a common garden sprinkler, the greatest success following after two applications, when the larger proportion of the cabbage worms were, in an hour or two afterward, found either to be already dead, or stupefied. When burned, the fumes of the powder prove fatal to more delicate insects, as in the case of mosquitoes, above noted. Its use in this manner is also recommended as a protection to furs, woolens, botanical specimens, etc., the objects to be fumigated being first inclosed in a tight box. § An alcoholic extract is sometimes made, which, used by dilution in water, at the rate of one part extract to twenty, or even forty, parts water, has proven very successful when applied by spraying over the leaves of plants attacked by exposed larvæ.

As above stated, in any use of pyrethrum, it is important that the powder be fresh, its valuable property being volatile, and readily lost by exposure of the powder to the air. The "buhach" prepared by Mr. G. N. Milco, Stockton, Cal., from the flowers of pyrethrum cinerariæ-folium grown by him for this purpose, in California, is said by those who have made comparative trials, to be superior to the imported powders, as well as much cheaper.

Kerosene is of well-known insecticidal properties. The principal danger attendant upon its use is the danger of injury to the insect-infested plant or animal in whose be-

\* Professor J. A. Lintner, Rept. N. Y. State Entomologist, 1882, p. 36.

† *American Entomologist*, III, 1880, p. 105.

‡ *American Naturalist*, XV, 1881, pp. 145-7.

§ *American Naturalist*, XV, 1881, p. 817.

half this agent may be employed. True, the application of the undiluted oil has been made upon leaves of certain plants without injury, yet oftener have the plants suffered decided injury, even when the oil has been used considerably diluted. We find it valuable in greenhouse work for the removal of scale, and other insects of that class, but have learned to use it with caution. Any experiment in the use of kerosene should be commenced only with the oil in a sufficiently diluted form, increasing the strength as needed, if found possible without injury to the plant. The difficulty of properly combining kerosene with the water used in diluting it has been satisfactorily solved by first preparing an emulsion of kerosene with milk by a thorough churning or shaking of the liquids until they assume the appearance and consistency of a butter. The time required for the operation is from fifteen minutes at a temperature of 75°, to forty-five minutes at a temperature of 60°. The relative quantities of the ingredients may be varied within reasonable limits without endangering the success of the experiment, and either sweet or sour milk may be used. The proportions preferred by Mr. H. G. Hubbard, from the report of whose experiments the above statements are taken,\* are:

Kerosene (refined).....	2 parts.
Cow's milk (preferably sour).....	1 part.

The butter made from these proportions may be diluted from 12 to 15 times with water for killing scale insects in the open air. Mr. Hubbard's experiments were made upon the various orange and lemon-tree pests, but indicate to us of northern orchards the range of possible success with many of the enemies with which we must contend.

Arsenic, in its form of Paris green, has been used for at least fifteen years, having been first introduced as a remedy for the attacks of the Colorado potato-beetle. While it was extensively used for this purpose after its introduction, its use was found to be open to several serious objections, the color of the poison rendering it inconspicuous when sprinkled over infested plants; the risk of accidental poisoning of men or animals is great; the considerable proportion of arsenic in this compound renders the plant itself liable to injury through the careless application of the undiluted powder; the cost of the poison is considerable when large quantities are required. Latterly, a much cheaper form of arsenic, under the name of London purple, has been used as a substitute for Paris green, and as it is in a measure free from the objections above mentioned in case of the latter poison, its claims were promptly recognized. An analysis of this poison by Peter Collier, Chemist of the United States Department of Agriculture,† gives the following proportions:

Arsenic acid.....	43.95 per cent.
Lime.....	21.82 "
Rose aniline.....	12.46 "
Insoluble residue.....	14.57 "

And the remainder of unimportant substances.

This compound is not soluble, or but slightly, in water, and its pronounced purple color indicates its presence upon foliage even in small amount. Its particles are much more finely divided than those of Paris green, and a given bulk of the purple will be capable of much greater distribution than an equal bulk of Paris green. It is likely to injure foliage if applied in too great quantity.

London purple may be effectively applied, in mixture with water, one-half pound of the powder being sufficient for fifty gallons of water,‡ a little flour being added to render the mixture more adhesive, and less likely to run off the foliage to which it is applied. The arsenical poisons are, of course, effective only against those insects which are likely

\* Rept. U. S. Dept. Agriculture, 1881-82, p. 113.

† Rept. U. S. Dept. Agriculture, 1878, p. 144.

‡ Riley. Cotton Worm Bulletin, 1880, p. 62.

to take the powder internally, with their food—the solid external portions of the plant. They might profitably be employed against the various leaf-feeding caterpillars, beetles, grasshoppers, and similar insects, but would be useless in combatting the tarnished plant bug, the squash bug, and other sap-sucking insects. We last spring secured the protection of parts of our apple orchard from the depredations of the codling moth, by spraying the trees with a mixture of a few ounces of purple in a barrel of water. The paper bands, placed upon all trees alike—those not sprayed, with those sprayed—were found to entrap a much smaller number of larvæ upon the latter trees, as compared with the bands upon those trees not poisoned. We are therefore encouraged in our attempts to subjugate this insect in our orchards, and shall make more extensive and careful tests in the spring coming.

I spoke above of the inefficacy of arsenic, or other poisons of its class, against a certain order of insects, including that ubiquitous pest, the tarnished plant bug. In his comprehensive and valuable paper upon insects attacking the strawberry,\* Professor Forbes has assured us of the value of kerosene emulsion, and of pyrethrum, in combatting this insect, which is seemingly the cause of woes unnumbered in the orchard and garden, being lately accused as a principal cause in the spread of pear blight. Careful and intelligent experiments may develop much wider fields of usefulness for these agents. Indeed, the faithful application of our present knowledge upon this topic would do much to relieve us, as fruit-growers, from the heavy tax now annually suffered through the depredations of noxious insects, and our present losses may often be directly due to our slowness to avail ourselves of what has already been shown true, through the experiments of our leading students of economic entomology.

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[From advance sheets Report of American Horticultural Society.]

## ON SOME OF NATURE'S METHODS OF SUBDUING INJURIOUS INSECTS.

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BY WILLIAM SAUNDERS, LONDON, ONTARIO, CANADA.

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It is a frequent source of wonder, why certain species of injurious insects occur during some seasons in immense swarms, causing much alarm, and inflicting the greatest injury; while the next season, when one might reasonably expect from their well-known fertility of reproduction, that their numbers would be vastly increased, they are found to be comparatively scarce. In this intermitting manner we have invasions of army worms, canker worms, span worms, tent caterpillars, grasshoppers, and a host of other injurious insects, which defoliate our trees and vines, consume our field and garden crops, and sometimes, when these destructive creatures cover large areas of territory, they induce much human privation and want.

It must be obvious to all who have given this question serious thought, that up to the present time, whatever may have been the devices and inventions for trapping and destroying such insect hordes, any efforts which have been made by man for their destruction are comparatively insignificant, and utterly fail to account for the wonderful oscillations between scarcity and the greatest abundance in these several forms of insect life. To acquire any true insight into the causes which bring about these remarkable variations, we must pry into nature's secrets, and, looking behind the scenes to which the view of the casual observer is limited, we shall find reasons for thankfulness, in that

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\* Transactions Mississippi Valley Horticultural Society, vol. II, p. 242.

a wise Creator has so nicely balanced the contending hosts of insect life, that when from any cause any one form obtains for a time a preponderance, that particular form is so preyed on by rapidly-increasing hosts of insect enemies, aided by insectivorous birds, and sometimes by destructive diseases, that decimation soon occurs, and the unnatural increase is soon reduced within its normal proportions. The fecundity of insects is so great, that were the natural checks on undue increase in any injurious species entirely removed, we should in most cases soon be compelled to abandon the cultivation of those plants which such insects select for their food.

We would not on any account be understood as belittling the agencies which man can bring to bear on certain destructive insects; on the contrary, we hold that the study and practical application of economic entomology is of the greatest importance in every agricultural and horticultural community, for if we can by the use of judicious measures materially lessen the loss which these visitations always occasion, a great saving will be effected, far more than sufficient to compensate for the labor or expense incurred. More especially does this apply to fruit-growers, because their operations are conducted within comparatively limited areas, and hence they can often without much labor keep insect foes in subjection, which if allowed to take their natural course would entail severe loss. It is however none the less true, that where destructive insects of any sort have prevailed over large districts, whether affecting fruit or field crops, their future, whether "to be, or not to be," has been left to be settled mainly by the controlling forces of nature.

Among the chief agencies employed by nature in subduing injurious insects, are other species of insects, known generally as friendly insects. These insect friends may be divided into two classes, namely, predatory and parasitic species. Among the former we have what may be regarded as the carnivora among insects—the lions and tigers of the insectivorous world, who, fleet and powerful, roam about, "seeking whom they may devour." Foremost among these are the ground-beetles, or *Carabidæ*, a large family, consisting of many genera, embracing several hundreds of species, most of whom live largely or entirely on other insects. Some of the larger forms, such as the copper-spotted calosoma, *Calosoma calidum*, and the green caterpillar-hunter, *Calosoma scrutator*, are commonly known as caterpillar-hunters, for the reason that they usually pursue their useful avocation in open daylight, and, being of large size, their proceedings are easily observed. These species are quick in their movements, seizing their prey with relentless zeal, and devouring them with great rapidity. Another useful group is known under the name of tiger-beetles, *Cicindelidæ*, a race remarkably active in their movements, and possessing keen powers of vision, which enable them quickly to discover the objects of their search. The lady-birds also, *Coccinellidæ*, well deserve mention here, for they not only devour small insects, but also feed largely on the eggs of other insects. A large proportion of the useful insects thus far referred to devour other insects, both in the larval and perfect condition.

But man's insect friends are not confined to the beetle tribes. Among the *Hemiptera*, or true bugs, there are loyal and true species, which attack man's enemies with vigor, and suck their blood to the last drop. The observant eye will occasionally detect these creatures in their useful mission, with their extended spear-like proboscis thrust into the side of a caterpillar, quietly reducing it to a shriveled skin; or, if the larva attacked shows much activity, its squirming body is often hoisted aloft in mid-air, and there gradually emptied of its contents.

Friendly insects are also found among the *Neuroptera*. The larvæ of the lace-wing or golden-eyed flies, *Chrysopa*, are very active and useful creatures, and devour immense numbers of aphides. Their formidable jaws are tubular, and are furnished with a bulb-like base, by the alternate expansion and contraction of which the soft bodies of the

insects they feed on are rapidly emptied of their contents. Some of the tiniest mites, which are scarcely visible to the unaided eye, also render us great service by feeding on the eggs of injurious insects. The egg-clusters of the tent caterpillar, *Cliosiocampa Americana*, are very liable to be either partially or wholly destroyed by this means.

Among the *Hymenoptera*, or four-winged flies, man has many friendly helpers. Many species of wasps, which construct cells for their young to live in, store these cells with various insects, both in the larval and perfect forms, and when a sufficient quantity of food has been thus provided to furnish a supply for a wasp during the period of its larval existence, a single egg is deposited, and the cell closed, usually with tempered clay or earth. Here the egg soon hatches, and the young larva begins to feed on the insect stores provided by its thoughtful parent, and by the time the contents of the cell are consumed the solitary grub has reached the end of its larval life, when it changes to a chrysalis within the cell, from which there soon escapes a mature wasp. One species is known to pack its cells chiefly with canker-worms, and many others use injurious insects for this purpose. While multitudes of insects are consumed by these wasps, we are under far greater obligations to the ichneumon flies, which also belong to this order *Hymenoptera*, for the friendly offices they perform.

These insects belong to the second, or parasitic class. They deposit their eggs either under or on the skin of the caterpillar they attack. In this class may be found insects of all sizes, from the tiny *Pteromalus puparum*, which preys on the cabbage worm, and is so small that it requires a keen sight to follow it in its movements, up to that large and powerful species, the long-tailed ophion, *Ophion macrurum*, which parasites and destroys the caterpillars of our very largest moths. Some time ago I had the opportunity of watching a female of the little parasite of the cabbage worm, while engaged in the work of depositing her eggs. She settled herself quietly down on the back of the caterpillar, towards the hinder end of its body, with her head towards the caterpillar's head, and paused awhile; then, with a sudden movement of her ovipositor, so quick that the motion almost escaped detection, she thrust an egg under the skin of her victim. The caterpillar seemed startled; its body quivered; and it jerked its head suddenly about as if it wondered what was the matter. The larva soon quieted, and the little tormentor sat perfectly composed on the spot where she first settled. Presently another thrust was made, followed again by uneasy movements of the caterpillar; and in this manner, in the course of a very few minutes, quite a number of eggs were deposited. The eggs so placed soon hatch into little grubs, which feed upon the fatty portions of the body of their victim, avoiding the vitals, and so injure it that it dies soon after it has entered the chrysalis state. The parasites complete their changes within the chrysalis of the butterfly, and escape through small holes made in the chrysalis. Some of the larger species deposit only one or two eggs in a single caterpillar; and as on account of the size of these insects they cannot avoid being seen by the caterpillar, their movements are dextrously and quickly made. The ichneumon flies are among the most active of the insect hosts: they fly rapidly, and when alighted, run with considerable speed over the upper and under surfaces of the leaves of the plant, shrub, or tree, on which they settle, piercing eagerly with keen sight into every nook and corner in search of caterpillars. The habits of all the species in this group are very similar.

Another group of useful insects is found among the *Diptera* or two-winged flies, and are known as tachina flies. These deposit their eggs on the skin of the caterpillars they attack, placing them in small groups, on the back a short distance behind the head, where they are firmly glued to the surface. The young larvæ when hatched pierce through the skin of the caterpillar and feed upon its substance in a manner similar to that of the ichneumon parasite.

Caterpillars are also subject to the attacks of contagious diseases, which sometimes

carry them off by thousands. Those reared in confinement, such as silk-worms, are often decimated by these plagues, and those species which swarm on our trees and vines, and also in our fields, are also affected in a similar manner. These diseases are generally held to be of fungoid origin, and are communicated either by contact or by spores disseminated in the air. Large numbers of the forest tent caterpillar (*Clisiocampa sylvatica*) are often destroyed by this means. The larvæ are usually almost full grown before they are attacked; then, when the disease reaches a certain stage, they remain motionless, fully extended and retaining a firm hold on the trunks of trees, on fences, or any other material on which they have been crawling, and shortly, although they retain for a time a natural appearance, they will be found to be quite dead, and their bodies so softened as to burst with a very gentle handling. A species of cut-worm, *Agrotis fennica*, which has been very abundant and quite destructive to clover and other crops in some parts of Canada and in Michigan during the past year, has been so badly affected by the same disease that it has been difficult to rear any of them to perfection. Out of some fifty or sixty specimens collected by me for this purpose, nearly all were affected by this disease, and only one lived long enough to become a chrysalis, and this one did not mature the perfect insect. Even winged insects are not exempt from such diseases. The common house-fly is very subject to a fungoid disease in the autumn, the spores and filaments of which multiply with amazing rapidity in the fluids contained in the fly's body, and soon destroy life, forming a circle of luxuriant growth all around the body of the victim. Examples of this may be found on the windows of almost every dwelling during the months of September and October.

The last agent we will mention as sometimes fatal to insect life, is a sudden frost. It is well-known that the eggs of insects will remain uninjured through our most severe winters, but after hatching, if soon exposed to the depressing influences of frost, the young caterpillars die in great numbers.

Thus we see how parasitic enemies, fungoid diseases and climatic changes are so many controlling agents, used by a wise Creator to keep in check the undue increase of such insects, which by their wonderful fecundity would without them bid defiance to all man's efforts at repression, and cause the horticulturist to lament with the ancient prophet, "That which the palmer-worm hath left hath the locust eaten, and that which the locust hath left hath the canker-worm eaten, and that which the canker-worm hath left hath the caterpillar eaten."

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## SOME PARASITIC FUNGI THAT INFEST ORCHARDS AND GARDENS.

BY W. A. KELLERMAN, PH.D., KANSAS STATE AGRICULTURAL COLLEGE.

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Many of the so-called diseases of our fruit trees are caused by the attack of vegetable parasites, or parasitic fungi. These are often though not always, microscopic in size, and from their diminutiveness are usually entirely overlooked, the attention resting merely on the effects they produce. Careful microscopic examination reveals them, however, and shows that their vegetative part consists of minute filaments, or tubes, often-jointed, that is, many-celled. These filaments, or *hyphæ*, as the botanist calls them, penetrate the tissue of the host plant and from the latter extract the nourishment that the parasite needs for its growth and for the production of its fruit. No green coloring matter, technically called *chlorophyl*, is ever found in the *hyphæ* of the fungi, and this

fact necessitates such a mode of life as they display. It is by means of chlorophyl in the cells that plants are enabled to convert the inorganic food which they absorb from the soil and from the air into organic matter. Therefore fungi—being destitute of chlorophyl—of necessity live a parasitic life. There are many species that infest living plants, taking the food materials that the host plant intended for use in building up its own tissue and ultimately for the production of seed to secure the continuance of the species. These, therefore, when living on cultivated and useful plants, are injurious to our crops. Many other species are saprophytic, or in other words live on decaying tissue. Our puff-balls and toadstools are examples of saprophytic fungi. The microscope will reveal also, provided we have taken the plant at the proper stage of its development, hosts of minute bodies, mostly one-celled, but sometimes several-celled, that are attached to the hyphæ—in fact, produced by them. These are the *spores*, or seeds we might call them if we think only of their function. A seed, as of a sunflower or morning glory, has within it a tiny plantlet—an embryo which develops into the form of the adult plant that produced it when subjected to the proper conditions and furnished with appropriate food. A spore contains no embryo; it is a very minute body inclosing within a covering or cell-wall, a quantity of a semi-fluid material called *protoplasm*. In this protoplasm there is formative material or food material, out of which a young plantlet, simple in structure though it may be, is formed. Another preliminary remark worthy of mention is, that while many of the fungi produce an enormous number of spores to insure rapid multiplication, still others develop two or three different kinds, also in countless multitudes, thus increasing to a still greater extent the chances for the production of new individuals. Thus many of our “rusts” produce “summer” spores which are extremely thin-walled, and germinate in a few days after they are ripe. In a very short time, often but a week or two, from these new plants are developed, and arriving at the adult stage, they generate summer spores in like manner. And thus rapid multiplication, provided of course, that the weather is favorable to vegetative growth, is effected non-sexually, much like the rapid multiplication of *aphides*, or plant lice. Besides these delicate summer spores, they produce also “winter spores,” differing from the former in their habit of not usually germinating till after a period of rest, in that respect resembling most of our common seeds, and also differing in having very thick walls, enabling them to successfully withstand the winter. In the spring they germinate, penetrate with their hyphæ into the tissue of the host plant, and produce plants which give rise during the summer to the summer spores, and then later produce the winter spores, and so on again. With this explanatory preface, some account may now be introduced of a few of the many parasitic species that infest our common plants.

#### PLUM BLIGHT.

Everyone must have noticed, at some time, peculiarly enlarged and abnormal plums. Sometimes they are so elongated, and swollen to such size, that it may be doubted whether they are really abnormal plums, or growths of some other nature. Even a careful examination, unaided by the microscope, fails to reveal the cause of the monstrosity. When the plums are scarcely half-grown, an infected one may be detected by its less-deeply green, or somewhat pale color. It increases rapidly to its abnormal size, and takes on its peculiar shape. It may be more or less curved, or merely elongated cylindrical, or greatly enlarged at the upper end. If it be broken open, no kernel or stone will be found. It is simply hollow within, or at most the interior is occupied with very loose tissue. The surface may be furrowed, or uneven. Finally, it appears as if covered with a whitish “bloom,” of velvety appearance, which soon turns yellowish. At this stage it may fall to the ground, or, if it remains hanging on the tree, it is attacked by fungi that feed on decaying substances.

To study the cause of this pathological growth, one must call in the aid of the microscope, and examine the plum at successive stages in the development. If one that betrays its infection, in the way mentioned above, be selected, and thin sections of it be placed under the microscope, there will be found in the fibro-vascular bundles—those fibers that are plainly visible to the naked eye—very many exceedingly minute threads. These threads—collectively called the *mycelium*—have many cross-partitions, or joints, and are very much branched, and constitute the growing or vegetative stage of a vegetable parasite—that is, a fungus, which from the botanists has received the name of *Ezoascus pruni*. This *mycelium* will be found soon to grow abundantly in the loose tissue, or parenchyma as it is called, the threads ramifying between the cells, but not into them. If a portion of the tissue now be placed under the microscope, it will be found that there is a network of *mycelium* throughout the tissue of the misshapen plum, but densest just beneath the epidermis, or outer layer of cells. The threads then grow outward, between the epidermal cells, till they reach the cuticula, which is the delicate continuous layer applied directly to the epidermis. They then bend at right angles, and continue to grow under the cuticula, gently raising the latter. The threads branch voluminously until the whole plum, except only at the stomates, is completely covered under the cuticula with the *mycelium*. The joints are close together, so that the layer consists of a multitude of cells that are much smaller than the epidermal cells. Finally, each one of these begins an upright growth, lifting thereby the cuticula, and this is the stage indicated by the peculiar velvety covering seen in the monstrous plum. These cells, when examined microscopically, will be found to be club-shaped and rich in protoplasm. Presently a partition is thrown across, in the lower part, so that each now consists of two cells, the lower, smaller and slenderer being a pedicel, or stem, as it were, for the upper. The protoplasm, or material in the upper cell, becomes shaped into eight masses, and these eight masses become the eight rounded or oval spores, turning yellowish as they ripen. They escape from the sacs that contain them, germinate, and penetrate the plum in a mysterious, that is to say, as yet unknown, manner. If the stem of the infected plum be examined microscopically, the *mycelium* will be found there, which shows that it was in the twig that bore the fruit. The same branch produces, year after year, infected plums, which shows that the *mycelium* is perennial in it. This indicates the mode of procedure that should be instituted to combat the disease successfully. One thing to be done is to gather the infected plums, before the spores of the fungus are ripe, and burn them. This ought at least to check, to some extent, the spread of the fungus. But if the *mycelium* lives, from year to year, in the branches, it is evident that they also must be destroyed in order to completely eradicate the parasite. Care should accordingly be taken to cut sufficiently far back into the older wood, so as to remove every trace of the *mycelium*.

#### PEACH CURL.

Perhaps no disease that could be mentioned in connection with our orchards is so well-known as that called peach curl. But while the curled, distorted, and discolored leaves are familiar to every one, the character and life history of the parasitic fungus that causes the phenomenon are not quite so familiar to the general reader. With the aid of the microscope one can readily determine for himself that a fungus resembling very much the one described above as causing the plum blight, infests every diseased leaf, and investigations have shown that this parasite causes the disease. It belongs to the same genus as the preceding, having for its botanical name *Ezoascus deformans*. Like the former fungus, the vegetative threads or mycelium would be looked for in the tissue of the peach leaf. The cells or sacs that contain the spores could be scraped from the surface at the time they are ripe, and this stage, therefore, would be most easy of examination. The parasite invades the twigs also. No further elucidation is necessary in order to decide on a rational mode of treatment. The knife must be vigorously used,



and all the excised branches, as well as infested leaves, should be burned—the object being both to destroy spores just being formed and to thoroughly eradicate every mycelial thread.

#### THE GRAPE MILDEW.

Early in the summer, spots of a yellowish or brownish color may be noticed on the upper surface of grape leaves. The corresponding spot on the under side will be a whitish patch, like frost work. This may be plainly seen on the smooth-leaved, but less clearly on the woolly-leaved varieties. If a portion of this delicate material be carefully transferred to the stage of the microscope and but moderately magnified, it will be seen to consist of tree-like forms loaded with fruit, appearing like a miniature forest. The upright threads, or hyphæ, as the vegetative filaments are always called, proceed from the stomates, or breathing-pores of the leaf. They are so slender that many find exit from one and the same stomate; they are somewhat branched above, and bear at the tips very many oval bodies, which botanists call *conidia*. These conidia are the spores, or seeds as we might call them if we have in mind not their structure but their function only. These conidia drop off at maturity, and after a very short time the protoplasm that each one contains divides into several masses, and then the cell wall (for the conidia are single, simple cells) ruptures, allowing the individual masses to escape. Each protoplasmic mass, technically called zoöspore, is found to be furnished with two cilia, or attached threads, by means of which it swims about in the drop of moisture it may have alighted in. Presently it comes to rest and begins to germinate, producing a filament that penetrates the plant and in its tissue develops its mycelium. Thus it is seen how these multitudes of conidia, or non-sexual spores, multiply the fungus, whose real name, by the way, is *Peronospora viticola*. If now we trace back these hyphæ through the stomates, and examine the part of the plant that is below the epidermis, which can be done by making very thin sections of the leaf, and examining them microscopically, we will find that the slender filaments ramify between the cells which constitute the interior of the leaf, and which are not compactly joined. The nourishment of the parasite is obtained by "suckers" which the hyphæ produce, and which actually penetrate the cells of the leaf-tissue. If search be made very late in the season, another kind of reproductive body might be found. It is a thick-walled winter spore. It is what would be called a sexual spore, the result of a process analogous to what is called fertilization in the higher plants. This spore (*oöspore*) survives the winter, which the tender, delicate conidia could not do. This, therefore, is a special production for the continuance of the species, as the conidia are for rapid multiplication during the warm season. In the light of this outline of the life history of the grape mildew fungus, it can be suggested that all the leaves in the early autumn ought to be gathered and burned, thus destroying the winter spores. If this could be thoroughly done, a marked check in the grape-vine disease should be effected. It might be thoroughly effectual were it not a fact that the mycelium is perennial in the grape-vine itself. Therefore, previously infected parts must also be destroyed in order to eradicate the disease.

#### STRAWBERRY-LEAF BLIGHT.

Small white spots surrounded by a reddish border are often seen on strawberry leaves; the spots are numerous on more exposed plants, and it is often supposed that in the burning rays of the sun is to be seen the cause of their appearance. But insects in other cases are thought to produce this diseased condition. It is, however, well known that the phenomenon is attributable to a parasitic fungus called in botanical language *Ramularia fragariae*. It is very inconspicuous and requires magnification to reveal its existence. It is located on the white spots both on the lower and upper sides of the leaf, but usually more abundant above. It occurs in the fruiting stage throughout the summer. When carefully removed from the dead white spot and placed on the stage of the microscope it

will be found to consist of short, slender, upright hyphæ or filaments bearing at their tips much elongated and sometimes jointed bodies, which are the spores. The mycelium which penetrates the tissue of the leaf provides the nourishment for the parasite, and the leaf-cells robbed of their food materials languish or die, presenting the whitish appearance of the spots. I do not know that the injury to the strawberry plants, which this parasitic fungus would be supposed to cause, is very marked, nor do I know of remedies that have so far been employed against it.

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## THE NUTRITION OF PLANTS.

BY T. J. BURRILL, PROFESSOR OF BOTANY AND HORTICULTURE, ILLINOIS INDUSTRIAL UNIVERSITY.

The water contained in living plants constitutes by far the greater proportion of their weight. The amount is by no means constant in the same tissues, much less the same in different parts of the same plant. A succulent, growing shoot of a tree will lose nine-tenths of its weight by drying, while a ripe seed from the same tree may not lose more than one-tenth, by the same process. The wood of a healthy apple, or oak, loses by drying, at a temperature of boiling water, nearly or quite one-half of its green weight; and what will be surprising to some, the heart-wood will lose as much as the sap-wood, except the cambium portion of the latter during or soon after the season of growth.

This large quantity of water exists as water, unaltered in any way, though usually having dissolved in it several other substances. Yet the water is essential to the physiology of the plant, not indeed as food, but for necessary physical or mechanical processes of life and growth. If the amount of water is much reduced by any means, the plant flags, or wilts; the cells lose their normal turgidity, and every life function ceases. In the ripening process water is expelled, but in a very different way from evaporation by heat. Desiccation by external means does not ripen the tissues. The latter may be prevented, by withholding water, even more readily than induced, unless careful attention is paid to the condition of the plant at the beginning. The point here is, that this large amount of water in living plants—amounting to four-fifths their weight—is essential to them; necessary to their continued existence, and to their normal development.

But this is not all. About one-half the weight of the dried substance of plants is water in another form. It is not really water as it exists, but the elements of water, and these, along with carbon, make up the solid substance of the plant. The water elements are oxygen and hydrogen, one part of the former to two of the latter by bulk, or, by weight, of eight to one; and these proportions remain the same in the composition of wood, or rather of the substance called cellulose, of which wood mainly consists. When plant-tissues have been thoroughly dried in an oven kept at 212° Fahr., one might suppose that there could be given off no more water from the hard, perhaps brittle, substances. But if these are now burned, the most of the material passes off, as we know, as gases. If the combustion is imperfect, there is more or less visible smoke; but if the material is completely oxydized at first, nothing escapes which can be detected by the eye. Now nearly one-half these invisible products of the burning, kiln-dried wood is the vapor of water, which has only to be cooled to reach the liquid state. In the process of combustion, the water elements are united again with each other, but the combinations in which they were held in the wood are broken up.

It thus appears that the abundant substance which we know in nature as a typical liquid, the type of instability, the most impracticable thing possible one might think in building solid structures really does constitute something like nine-tenths, in one form or another, of the frame-work of plants. If so, surely the first place should be given it in a discussion of plant nutrition. Water is used in abundance as a necessary part of the plant tissues in a mechanical sense, and it is used as a true food substance, constituting in a chemical sense a considerable portion of the solid material of the plant structure. In the former it remains water; in the latter condition it is no longer a liquid, but joining in a molecular sisterhood with carbon forms the wood substance of plants.

Experiments have conclusively proved that plants obtain the water which they require, for one or both the purposes just mentioned, through the roots and through the roots only, if we confine ourselves to our garden and field crops. It is very often supposed that leaves absorb moisture from the air, and because wilted plants revive at night when the dew settles upon them, this is supposed to be proved. So when a potted plant is allowed to wilt for want of water it may often be seen to regain its normal condition by sprinkling the top with water in such way as to give none to the roots. But these things are entirely possible without absorption by the leaves. As the roots are actively absorbing water from the soil during the time, it only requires that evaporation shall be less than the supply furnished for the revival of the plant. When the loss of water above is greater than the amount absorbed—however great the latter—wilting must occur; but revival ensues as soon as the evaporation is sufficiently checked to allow an accumulation of the fluid absorbed by the roots. Sprinkling the leaves simply reduces the evaporation from them, and permits the activity of the roots to sufficiently furnish the tissues with water. It is, however, a fact that badly-wilted leaves do absorb some moisture from a saturated atmosphere, but turgid leaves do not, and practically in the former case the amount so obtained is scarcely worth considering. We may say that all the water obtained by plants for whatever use is furnished from the soil, through the roots.

One of the most remarkable things about this is, that land plants are capable of extracting from soil which seems dry, sufficient water for their use, not only as already mentioned, but to provide also for the marvelous quantity constantly exhaled from green leaves—amounting on an average to one and a quarter ounces for each square foot of leaf surface in favorable weather during twelve hours of day-time. As there is on a large forest tree 200,000 square feet of leaf surface, the amount sent off from its foliage, each sunshiny summer day, reaches the astounding total of seven and three-fourths tons, or nearly fifty barrels of forty gallons each! With ten such trees to the acre, we shall have 500 barrels given off from this area. Experiments have shown that an acre of beets throw into the air each favorable day about eighty barrels of water, and this may be taken as a low average for fields of cultivated plants. Maize and sugar cane must give off very much more. Taking this eighty barrels as a basis, think of 51,200 barrels of water pumped from the soil into the hungry air for every square mile of land each fair summer's day—2,816,000,000 barrels from Illinois in the same time! This represents something over one-eighth of an inch deep over the whole surface. If the plant does owe much of its substance to water, it is amazingly prodigal of the precious liquid! It however must be borne in mind that the figures mentioned are for weather specially favorable for evaporation. During the night and in cloudy days little is exhaled. A clear sun, a high temperature and a brisk breeze greatly promote the transpiration of water from green leaves.

To obtain their enormous supplies of water from the soil, plants are excellently equipped, in the great development of their root systems, and the clothing of their younger portions by myriads of exceedingly slender epidermal cells, called root hairs. Taking the latter into account, it is probable that the root-surface of a tree is fully equal

to that of the stem and leaves. If a large forest tree has anything like five acres of absorbing root surface, it is not so astonishing, after all, that fifty barrels of water per day can be supplied to the plant. The extent of roots is far greater than usually supposed. On our Illinois prairie soil, blue-grass in pastures sends down roots in considerable numbers five to six feet, clover often twice that depth. Apple trees in eight years have been found to send out roots horizontally twenty feet from the trunk; a Concord grape-vine in two years produced a root which was followed thirteen and a half feet; a Lombardy poplar developed roots in abundance beneath an old wood-yard seventy-five feet distant from the trunk. In New Hampshire the living roots of an elm are authoritatively said to have blocked a drain tile 400 feet from the base of the tree! Whatever may be said of this last, the others are vouched for by myself, and were observed when the subject was under investigation, so that the closest examinations were made and mistakes rendered improbable if not impossible.

One thing further needs to be noted, viz.: that the roots of most land-growing plants are not only fitted for the absorption of moisture from soil without free water, but do their best work when there is no visible water about them. In most such cases plants suffer when their roots are immersed in standing water. Among other injuries, the root hairs perish. The roots of purely aquatic plants have no root hairs.

The next substance in order of quantity in the structure of plants, is carbon. This composes nearly one-half the weight of the dried wood. We see it retaining the perfect shape and size of the original structure in carefully-prepared charcoal. In the manufacture of the latter the water in the two states above described is expelled and the carbon alone retained. The amount, though by no means so great a proportion of the green plant as is composed of water, is in the aggregate very large. For every ton of green wood we may estimate about one-fourth or five hundred pounds of carbon. Vegetation gives us the only supply we have of this material in the free state; the coal dug from the earth is only the preserved carbon of former plant growths. Even plumbago and the diamond are believed to owe their origin to the assimilative activities of green plants.

This substance is obtained by the living plant in the shape of carbonic acid, and is for the most part absorbed by the leaves from the atmosphere, in which it is constantly present, and upon an average constitutes four parts in every ten thousand parts of the gaseous envelope of the earth. It also enters the roots, being absorbed to some extent in water, and thus ultimately gains the leaves, where at all events it must go before becoming of service to the plant as food. The process called assimilation in the green parts, under the influence of light, is the one striking and characteristic phenomenon of vegetation. In this process the carbonic acid is separated into its constituent elements, carbon and oxygen, the former retained and the latter given off to the air. As there is a strong chemical affinity between these elements, an expenditure of force is required for their disassociation, and this force is believed to be furnished by the sun. Man, however, has not yet been able to imitate the leaf in directly utilizing after this method the light and heat sent freely upon us. Possibly he may learn how some day, and be able to set up a manufactory of starch out of carbonic acid and water; thus making food for himself from the abundant supply of the air and of a spring or well! In the meantime, however, we may best content ourselves with the food supply gained from plants, and be thankful accordingly to our tireless benefactors of the vegetable world.

The continued supply of carbonic acid in the air is secured through the various forms of decomposition and combustion—the decay of animals and plants, the exhalation of the former in the breath and the products from all domestic and commercial fires. The atmosphere serves as a great reservoir which is continuously filled and as continuously emptied in an even and ceaseless balance of account. It is rare indeed that carbonaceous

manures need be added to soils for the food supply of crops growing thereon. These fertilizers have other important uses in the various physical or mechanical properties of soils; but plants ordinarily have abundant opportunity to help themselves to the carbon required from the air, providing other things are favorable.

In the combustible substances of plants there is one more element which demands our attention — nitrogen.

This exists in a free state in immense quantity in the air, composing four-fifths of its bulk. But plants are not capable of making use of this free nitrogen. This question has been long in dispute, but the weight of evidence is as stated. Bathed in an ocean of the substance, plants, like ourselves, must perish for the want of it, unless supplied in combination with other chemical elements, forming the so-called nitrates. Now these nitrates are not spontaneously formed in nature, or rather are formed only under certain conditions and through the mediation of peculiar agencies. No problem in plant nutrition has been so difficult to solve, nor so faithfully wrought, as this of the source of nitrogen as a food material for plants. Important knowledge has only recently been gained upon the subject, and it has not been until very recent years that anything like positive assertion could be made on many debatable points. Our knowledge now may be summarized as follows:

1. Plants cannot in any way use free nitrogen as food; neither can any plants whatever cause a combination of free nitrogen with other elements so as to produce assimilable nitrogenous matter.

2. The soil does not in any way fix the free nitrogen of the atmosphere so as to make it useful for plant food.

3. The unique, original source of assimilable nitrogen, capable of serving for the nutrition of plants, and in consequence the original source of the nitrogen of all animal foods, is in the chemical combinations, induced by electricity, of free nitrogen and of oxygen or hydrogen (of watery vapor) in the atmosphere.

4. The nitrates formed in the soil — the results of the so-called nitrification of soil — are due to a fermentation of nitrogenous organic substances by which ammonia and nitric acid are set free and the latter fitted for uniting with the alkalies or alkaline earths. This fermentation, like all other such processes of decomposition of organic matter, is due to living organisms. The particular species of microscopic plants (bacteria) which produces this particular fermentation, is present in all fertile soils, and really constitutes one of the factors of fertility.

5. Plants do absorb assimilable nitrogen by their leaves (ammonia); but the most of this food-element is taken into the plant through the roots, and hence from the soil.

These things, as has been stated, are conclusions reached through the most patient and laborious experiments and investigations, the results of which have often been to all appearances contradictory and at the time unexplainable. But at least some of the difficulties have been in late years removed, and one comes to have much confidence in the conclusions reached. Yet it is even now reported that a prominent American chemist finds that plants under normal circumstances do absorb and assimilate free nitrogen, and he accounts for the contrary statements by so many careful and skillful experimenters, by supposing the test plants were not under natural conditions, especially were not exposed to the atmospheric electrical currents as were his own.

The point which cultivators need most to observe is, that soils, in the ordinary processes of cropping, grow constantly poorer in the nitrogenous supplies, for the amount of ammonia and nitric acid brought down by rain and dew over the given area is much too small for the annual demands of thrifty vegetation. *No system of crop rotation or of green manuring can indefinitely perpetuate the fertility of soil. The time must come sooner or later, when artificial application of nitrogen-forming material is a necessity for continued lux-*

*uriance of plant growth.* Were it not that there is such a constant formation of assimilable nitrogenous compounds through the agency of electricity, the world must soon become uninhabitable. Were it not for the fermentation of dead organic matter through the agency of living organisms, each of which requires a magnifying power of at least five hundred times across to become visible to the human eye, there could be no crops, such as we now depend upon.

Under the most favorable circumstances, tillers of the soil ought to understand how best to economize the nitrogen supply in soils, and this becomes an imperative necessity in regions less favorably or fortunately situated. With the knowledge now at command, man has it in his power to perpetuate in this respect the priceless value of high fertility, or to vastly improve upon the natural richness of soils in some localities. On the other hand, from the want of knowledge or attention, he may soon set in operation great natural phenomena which bring in their train poverty and barrenness—a curse not only to one generation of human beings, but to the struggling populations of future centuries, an inheritance of suffering and destitution, instead of the helpful richness of our good Mother Earth when properly treated.

I will only add, here, that severe midsummer drouths, and especially upon bare surfaces unprotected from the burning rays of the sun by a beneficent screen of vegetation, followed at another time by deluges of water, are immensely wasteful, even alarmingly destructive. The precious stores of fertility are exhausted by unprofitable combustion in the one case, and swept off to the sea in the other. Let us not be content to sit at the feet of Science; but, inspired and equipped by the best knowledge of our day, put into practice, with economy and intelligence, the best work of the world.

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## FERTILIZATION.

BY C. M. MERWIN, OF TENNESSEE.

MR. PRESIDENT: I was notified by the Secretary that a paper on the pollenization of the strawberry was expected of me at this meeting, and I have prepared such as best I could, and hope that should discussion follow, we may gather from the experience of growers more light on this subject. This question of influence of the pollen of one variety upon another is an important one; that is, if a pistillate variety can be increased in size, improved in flavor, firmness and other desirable qualities, it is important that we should know it. Until within a few years, each variety of strawberry was supposed to have its special characteristics, as form, color, etc.; but now we hear growers speak of pistillate sorts, the Crescent, for instance, as being of large size when fertilized by the Sharpless, dark-colored and firm when fertilized by the Wilson's Albany, and so on. Now I take the position, Mr. President—though I am aware that many old experienced growers hold to opinions on this subject contrary to mine, and I admit that some experiments made in this direction, notably those by Professor Lazenby, are rather convincing—that a pistillate variety is not changed to any perceptible degree by the pollen of another variety.

Now it is a well-known fact that any variety will vary when planted on different soils and in different localities; that is, will not give the same results everywhere. As for instance, the Crescents as grown in southern Illinois are not as firm nor as dark colored as the Crescents grown in west Tennessee. The color and firmness of the west Tennessee

Crescents so nearly resemble that of the Wilson's Albany, that they are often sold in the markets for that sort; and some of our growers claim that this has been brought about by the influence of the Wilson. Now if southern Illinois growers used a soft, light-colored variety to fertilize their Crescents with, and west Tennessee used only the Wilson, the proof would be strong that it was from this cause that the variety differed so in the two localities; but such is not the case. The Wilson is used in Illinois as a fertilizer for the Crescent as much as in Tennessee; hence we must find some other cause, and in my opinion it will be found in the soil.

Some of the finest Crescents I have ever seen were fertilized with the Crystal City—a rather small, soft variety; and as large, fine Crescents as were grown at Gadsden the past season, where several hundred acres of this variety were cultivated, were grown by Mr. Rains in a field fertilized with what he called a bogus variety. The drouth of '81 destroyed his Wilson plants, and he ordered more from the North, but received this variety instead—a very small, sour variety, not worth picking, but having an abundance of pollen, and blooming with the Crescents.

I made a little tour of observation near the close of the berry season, among the growers at several stations around me, on purpose to see this change in the Crescent that I had so often heard about, but in no instance could I find a Sharpless or other variety than Crescent growing on Crescent plants. There was some variation in the different patches, but in no case could it be traced to the variety furnishing the pollen.

I also visited the strawberry section of southern Illinois, and was present at the strawberry exhibition at Cobden. I found growers there divided upon this question. Some old experienced growers were very positive in their opinion that the variety furnishing the pollen did impart its own characteristics. There were on exhibition Crescents that had been fertilized by about a dozen varieties, and there was considerable difference in the appearance; but there was also a marked difference between those grown by different growers, but fertilized with the same. Here would be a plate of Crescents, of large size—some inclined to Coxcomb shape. I inquire what variety was used as a fertilizer: "Why, the Sharpless, of course; can't you see the resemblance? And here, taste one; Sharpless, in flavor, ain't it?" "Yes," I reply; "that tastes and looks like a Sharpless." I cross the hall, and find on the table another plate in appearance like the other. "Now," I thought, "if these were fertilized by Sharpless, there may be something in this new theory;" but the grower informed me that the Crystal City furnished the pollen. And if I remember right, Mr. President, I saw at four of your packing houses, Crescents that had been fertilized with as many different varieties, and there was no perceptible difference in them.

As proof of this theory we are cited to the fact that Indian corn will mix. So it will, and exactly in the same manner as the strawberry, through the seed; but the seed is not the fruit. The pulp of the strawberry bears the same relation to the seed as the cob does to the kernels or seed of the corn: each is what nature intended—a receptacle for the seed. A row of sweet corn planted in a field of ordinary corn, if in tassel at the same time, would probably receive the greater part of the pollen necessary to fructification from the field corn, for the reason that the stamens are located at a distance from the pistils. The wind carries the pollen away and brings the pollen from other plants to this row; hence the corn is changed but the receptacle remains the same. The ear may be larger because the grains are longer, but there are the same number of rows and the same number of grains in each row as there would have been had there been no field corn within a hundred miles of it. If an eight-rowed variety, not an ear will be found on that row with more, though all the rest of the field may have fourteen or sixteen. It must be so, for a seed or grain was formed in embryo at the base of each pistil or silk without regard to the variety growing around it, and no one would claim that the field

corn could have any influence upon this row before the silk and tassel were visible, and certainly nature will not then add more silks to the one to accommodate the other; neither will the cob be changed in color, and I have no doubt that the flavor would be unchanged; though I have never eaten many cobs, and could not be positive about that.

It is also claimed that melons, squashes and cucumbers will so mix and mingle in the process of cross-fertilization, that squashes will be found upon cucumber vines and cucumbers upon melon vines; but they have never grown in that manner with me. I planted the past season cucumbers in my Japan melon patch, and melons among my cucumbers; and in gathering cucumbers for pickles I found it was a waste of time to look for them on the melon vines, and I was not able to detect any cucumber flavor in the melons. Now I have no doubt that the character of the seed was changed, and they could not be depended upon for a crop the next season, as there would probably be some variation, and possibly a hybrid would be the result. Some of the members at the meeting at Kansas City, in discussing this question, stated as their opinion, that this change was not all the result of cross-fertilization, but the influence of tree upon tree, or plant upon plant; and it is a very common opinion in the South that one variety of sweet potato will partake of the color and quality of another growing near—and a few years ago I half-way believed it too. I was then growing the Red Hayti with several other varieties, and I would sometimes find among the Southern Queen and Yellow Yam, potatoes streaked with red—sometimes half red. I then discarded the Hayti, and bought new seed; but I still find among those varieties specimens partly red, and have not grown a red variety on my place for six years. Now I have never seen a streak of red upon a Yellow Jersey, even when grown in next row to a red variety, and my theory is this: one or both of the parents of the Southern Queen and Yellow Yam were red varieties, while the Jersey is a seedling of yellow parentage, having no red blood in it.

If the character of the strawberry is so changed by the process of fertilization, why may we not look for the same results in the peach, the grape, or any of the other fruits? They would be as susceptible of change as the strawberry, and I would think more so, for their seeds have a greater proportional weight, or bulk, and it is well known that all admit of cross-fertilization; and while all of the fruits are not structurally the same, the process of seed development is identical, from organs connected closely with the pistil.

Nature prepares the seed in embryo, long before the blooming season, and when impregnated it is prepared for development. The pollen has performed its work, and neither it nor the plant from whence it came can have any further influence upon the growing pulp. If any change is wrought in the color, form, or flavor, it must come from the influence of those few tiny seed in process of development; and I cannot see how this could be. Were it so, there could be no reliable description given of pistillate varieties, and the descriptive catalogue must necessarily read thus: Crescent. pistillate; size large when fertilized with Sharpless; dark crimson when fertilized with the Wilson; a good shipper when fertilized with Sucker State; early or late, sweet or sour, according to season and degree of acidity of the variety furnishing the pollen. Now I have read the description of the Crescent as given by most all of the prominent nurserymen of our country, from its introduction down to the present time, and they have been as nearly alike as the description of any self-fertilizing sort.

I think, Mr. President, there is a good deal of imagination in this matter. To illustrate: if a gentlemen here should be pointed out to me as your brother, I would probably at once discover a resemblance between yourself and him, while had I not been informed of the relationship, I would have passed him a hundred times without noticing the resemblance, unless it was a very marked one; so it is that if a plate of berries be pointed out to us as Crescents fertilized with Sharpless, we can at once see a resemblance, but of



all the Crescents I have ever seen it would have been mere guess-work to have attempted to tell what variety furnished the pollen.

If this theory is correct, I hope to be convinced of it before planting-time, as it is my intention now to plant Crystal City with the Crescent; but I don't want to reduce the size of the Crescent, for it is none too large, so would change my plans, as, if the Sharpless increases the size, the Crystal City, being small, would as certainly diminish it.

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### CROSS-FERTILIZATION.

BY WM. PARRY, PARRY, NEW JERSEY.

The system of artificial cross-fertilization, usually adopted in producing new varieties of fruits, which, although attended with much labor and close attention and requiring a knowledge of botany not always possessed by farmers and fruit-growers, is very uncertain in its results, requiring several years of patient watching, nursing and tilling the the young seedling before any indication is shown as to whether the offspring will be either better or worse than the parentage from which it was produced. It has been said by good authority that after all this nice work, and waiting and watching, happy is the man who gets one prize to a thousand blanks; and is it any wonder, when we reflect how apt the pistil of the flower operated on is to be mutilated and permanently injured by cutting away the stamens around it with an unsteady hand?—and then taking pollen from the flower of a favorite tree or plant and applying it to the stigma of the blossom thus denuded of stamens, without knowing whether there existed any congeniality or liking for each other between the pollen and stigma. Forced connections contrary to nature seldom produce happy results. Man has not yet invented instruments with magnifying power sufficient to reveal all the mysteries of nature; and what is more difficult of comprehension than the existence of all the circumstances in the right quantities, and at the right time and place to produce the best results, not only in creating life, but such a life as will grow into a plant or tree and produce fruits superior to others of its class? That is beyond our power. We know that an acorn put into the ground will in time become a large tree, but the *cause* of the necessary transformation that must take place we know not, any more than we know the *cause* of gravity which holds the heavenly bodies in their sphere. Better leave those mysteries which we cannot understand to a higher Power, who comprehends and does all things for the best, and we make use of the means so abundant within our reach, of selecting the seed that will give new and improved varieties of fruits in the natural way, more certain and satisfactory than the unnatural, artificial mode of impregnation.

For the want of closer observation on the part of our ancestors, it has been reserved for the present generation to discover and make known the fact which had always existed, though not observed, that the size, flavor, texture, and general appearance of strawberries grown on pistillate plants will resemble those grown on the hermaphrodite plants that produced the pollen which impregnated the pistillate sorts; and that this principle applies not only to pistillate varieties, like Manchester, Crescent, and others, but also perfect flowering varieties, like Wilson and Sharpless, grown together, give larger, more irregular, and better-flavored Wilsons than when grown alone, while the Sharpless were darker in color, firmer and more acid than when alone. Here then we have cross-

fertilization in the natural way, and we are sure that seedlings grown from them will be cross-bred, partaking somewhat of the characteristics of both parents. But when cross-fertilization has been performed artificially, we are not sure that the offspring is cross-bred—especially if there is no perceptible change in flesh or pulp of the fruit producing the seed. Some people may think their pet seedlings are cross-bred (because they tried to have them so), when in reality they are not. The effect of this natural crossing is visible on the fruit before it is gathered, and we know just which berries to select for seed to get the benefit of the cross.

May not this principle apply to all fruits and flowers that produce pollen for the impregnation of their own or the pistils of other flowers? It has long been recognized with regard to vine "truck." It is well known that squashes, canteloupes and cucumbers planted near together will mix and amalgamate so as to destroy the appearance and good qualities of each other. A grain of red corn in a field of another color will impress its character on the surrounding hills as far as the pollen extends. The value of a patch of watermelons may be entirely destroyed by the admixture of pumpkin or preserving-citron seed.

We once had a field of watermelons with some missing hills that needed replanting. Not having seed of our own, we procured some of a neighbor, who, ever ready to do a good turn, furnished them without charge, which upon trial were dear enough, as they produced preserving citrons, the pollen of which contaminated the whole field. The melons grew finely, and were very tempting to travelers passing by. One day an old acquaintance living in the village a few miles off, who expected to have a company of his friends to dine with him the next day, happened to be passing along in his carriage. Seeing an abundance of fine-looking melons within convenient reach, thinking they might help out with the entertainment, and that he was well enough acquainted to help himself, without further ceremony he did so, and took home with him a few nice-looking melons. Next day when he and invited friends were comfortably seated around the table, those fine-looking melons were brought in with a carving knife by the side of them. He took hold of the knife and endeavored to dissect them, but finding it more difficult than he expected, and as he was not the man to be baffled over a watermelon, he put on more power and forced the blade through, and turned open a preserving citron to the full view of his surprised guests. It had a good effect, in teaching him never to take watermelons, however plenty they might be, without consulting the owner.

Here then we have evidence incontrovertibly establishing the fact that natural impregnation does affect the pulp or flesh of fruit so treated as well as the seed, and that we have a sure indication when the seed have been influenced by the cross merely by inspecting and tasting the fruit, when we are not sure that the seed are affected by artificial impregnation unless the effect of the cross is manifested in the pulp or flesh of the fruit. Thus we want knowledge, experimental knowledge, which is best of all; hence the importance of establishing agricultural experiment stations throughout all the States, that all things may be tried and the best retained.

Take a grain of wheat and one of barley: examine them; and is there a chemist in the land who can tell by analysis which should be planted in the fall and which in spring? Or have we magnifying glasses of sufficient power to determine whether a certain tree or plant will produce pollen the best adapted to impregnate the pistils of the flowers on the tree or plant which stands nearest? We have found out by experiment that the Sharpless and Wilson strawberry do produce pollen congenial to each other, and especially to the Manchester and Crescent strawberry; also, that the Hantbois strawberry does not cross readily with any of our common varieties. Here, then, we have a wide field open for experiment. Let every fruit-grower carefully note his own observations, and report them annually to this Society, whose influence extends over the whole continent.

About the year 1878, when planting an orchard of standard Kieffer pear trees, we set a few dwarf Bartlett trees among them, thinking that would be a favorable plan for having the blossoms on the low-growing Bartlett trees impregnated with the pollen falling from the taller standard Kieffer trees in the natural way. My intention was to plant the seed of the Bartletts thus subjected to copious showers of pollen falling from the Kieffers, and await the result of the new seedlings grown therefrom. But last year we noticed some of the Bartletts had the shape and outward appearance of Kieffer pears, and hung on the trees about one month later than other Bartletts grown here, and attained a large size, measuring  $10\frac{1}{2}$  inches around crosswise by  $11\frac{1}{2}$  around lengthwise; flavor and quality of flesh and color of skin like the Bartlett; size and shape of fruit and time of ripening more corresponding with the Kieffer.

Another illustration of the same principle: Last winter Chas. Parry, who lives adjoining us, removed a standard Bartlett pear tree, which had borne fruit for several years, to make room for moving his barn. The Bartlett tree thus removed was planted close by and nearly between two large standard Kieffer pear trees. All three bloomed profusely, and bore an abundance of fruit very similar in outward appearance to Kieffers. The Bartlett fruit was mostly double-turbinate, pointed at both ends, like Kieffers, yet when cut open had the natural Bartlett taste. The Bartlett tree having been recently moved, which checked its growth and weakened its reproductive powers, there was not strength and vigor enough to produce a sufficient supply of pollen to impregnate the pistils of the Bartlett blossoms, and they were in a suitable passive state to receive pollen from the more vigorous Kieffer trees near by, which furnished an abundant supply for themselves and the Bartletts also. There were but few seeds in the crossed pears; some had none, and others were defective. We have carefully planted the seed taken from those supposed crosses, which showed a marked change in outward appearance, hoping some of the offspring may produce fruit equal, if not superior, to that from which the seed was taken; and if we get a new seedling pear, or an improved Bartlett larger in size, of the same quality, and three to four weeks later in ripening than its female parent the Bartlett, crossed with the Kieffer, it will be of some value to fruit-growers who have no retarding-house to keep back their Bartletts.

In 1840 we planted a new pear orchard of 312 varieties. Some have done well; others not, and have been regrafted with Kieffers and Leontes. There was one row of Lawrence through the orchard that has always borne well of excellent fruit, and usual size. Several trees which were of but little value, in the row next to the Lawrence, were top-grafted with Leconte about five years since, and last year (1884) bore abundantly of large, handsome fruit and produced pollen sufficient to impregnate some blossoms on the nearest Lawrence trees, so that the Lawrence pears thus cross-fertilized in the natural way grew much larger than usual, and were about equal to the Leconte in size, measuring 10 inches around crosswise and  $11\frac{1}{2}$  around lengthwise.

We have grafted the Bartlett in the tops of Kieffer pear trees, also Kieffer and Leconte in the tops of Seckel pear trees, so as to bring the blossoms close to each other, the most favorable position for cross-fertilization in the natural way. We have also grafted the LAWSON, the most beautiful early pear ripening in July, of medium size and quality, in the tops of Manning's Elizabeth, a smaller pear of excellent quality, ripening nearly at the same time. If we can by this system of cross-fertilization obtain a new variety, combining the size and great beauty of the Lawson with the delicious quality of the Elizabeth, it will be an acquisition well worth the care and attention necessary to accomplish so desirable an object.

Twenty years ago when reading the works of Van Mons and others on originating new varieties of pears, I thought I was too old to plant pear seeds with any prospect of seeing the fruit grown from them. But about five years since that eminent friend of

pomology, Chas. Downing, sent us some choice pear seed, stating he thought we would like to plant them; and we now have in our lawn a strong, vigorous tree, ten feet high, grown from them. It bore last summer twenty-five pears. When about half-grown thirteen were removed, as we thought one dozen were enough for a tree five years from seed to ripen. Those pears are in fine condition now, measure from 9 to 10 inches around, and look as though they would keep sound for a month or two more.

If, then, we can distinguish from the outward appearance of pears those upon which the cross-fertilization has taken effect, and from the seed of those thus crossed can produce full-grown pears in five years, it seems to bring the production of new varieties very much within our control. Let us all then lend a hand to the good work, and endeavor to produce just such pears as we desire.

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## PLANTS IN THEIR RELATION TO DISEASE.

BY D. P. PENHALLOW, B.SC., QUEBEC.

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In the year 1795 Schüger brought together the very meager and scattered literature relating to diseases of plants, and published it under the title of "Empirical directions for the correct determination of diseases in forest and garden trees." This may be regarded as the beginning from which has since developed the now very important branch of botanical science which specially relates to disease—or vegetable pathology. At that time the science of botany was hardly more than an infant, and the special department of vegetable physiology was almost unknown. At that time also, the science of chemistry, upon which correct pathological knowledge is very largely based, was just entering upon a new era, and the more recently acquired facts were not then available in their application to the laws of vegetable nutrition and growth. It was during the period extending from 1770 to 1800 that we received from the hands of Priestly, Cavendish, Watt, and Lavoisier our first definite knowledge concerning the composition of the atmosphere and of water; and although these investigators instituted certain experiments to demonstrate the relation of these bodies to vegetable growth, their efforts were chiefly directed to the end of proving the effect of plants upon the soil and its various constituents. From this we will at once see how scanty and very unsatisfactory must have been the grand total of information in this direction. Everything pointed to recognition of disease by mere external peculiarities alone, nothing whatever being known of the actual sources of plant food and the specific relation of the various elements to the physiological processes of growth. Indeed, it was not until 1804 that special light was thrown upon this point when De Saussure in his "*Recherches sur la végétation*," first demonstrated from the chemical analysis of wood ashes, that the mineral constituents therein contained were derived from the soil, and that the normal growth of the plant was therefore dependent upon a proper supply of food from this source, an opinion which was soon strongly indorsed by Sir Humphrey Davy upon the basis of actual feeding experiments. These researches gave a new direction to effort, and served to leaven the scientific mind with an unseen and slowly-working, but none the less powerful impulse, which was to make its influence felt in later years.

Following Schüger, no general work appeared until 1833, when Unger published his work, since which time the literature of the subject has rapidly increased, chiefly, how-

ever, within the last few years, which seem to mark a period of particular activity in the field of vegetable physiology. And thus in this connection, such names as those of Loraner, Hartig, Frank, DeBay and others have become very familiar. The tendency has been largely, however, to regard the question of disease from the standpoint of origin in visible cause, such as injuries of various kinds; the action of insects, and particularly the development of parasitic forms; overlooking to a large extent the more primary and possibly greater influence of nutrition. In this latter direction, however, we have the valuable results of Nobbe, Schroeder, Erdmann and others, who by their careful researches into the special nutrition of the plant, have essentially demonstrated in a very decisive manner what DeSaussure inferred from his earlier experiments, viz., that all the mineral constituents usually present in the ash of plants are essential to the normal growth and perfection of the organism; and that while certain constituents are relatively more important than others, complete exclusion of any one from the food supply will sooner or later result in more or less conspicuous malformation of structure or debility of function. These relations were most strikingly illustrated in those now classical experiments with buckwheat, in which chlorine and potash were separately and collectively withheld. Depriving the plant of potash, it was seen that there was imperfect assimilation, as manifested both in the abnormal color of the leaves and the absence of starch from those tissues where it should have been present. Supplying potash but withholding chlorine, starch was found, but there was failure in its distribution to the centers of active growth, hence it became largely accumulated in the tissues where formed. As a necessary concomitant of this condition, the entire plant soon lost its normal color and became sickly and yellow, while there was also strong atrophy of the newly-formed organs. Restoration of the chlorine and potash in the form of muriate of potash seemed to restore the plant and its disordered functions to their normal condition. More recently, similar abnormal conditions have been found to be developed in the peach when suffering from the yellows, and a restoration has in this case been also fully effected by the use of muriate of potash as a specific. Indeed, the results obtained from direct experiment and analysis during the past fifteen years, as well as several hundred well-attested cases in which the practical application of the principles involved to large orchards has given most decided and favorable results, show that, so far as this disease is concerned, we have already passed beyond the experimental stage, and may now reasonably expect to find those whose orchards are suffering from this most destructive disorder, ready to treat them according to rational methods.

We thus see that these elements of food have their specific functions, and so, doubtless, have the various other elements found in the ash of the plant. One fact in this connection, however, must be kept closely in mind, and that is, that particular elements, or compounds, do not necessarily perform identical functions in all plants. For the same species, certainly, and perhaps for the same genus also, their functional value is the same, but the more distant the relationship, the more widely will the physiological characteristics of the plant be separated, and so will the special value of any element in the processes of nutrition and growth become subject to wider variations. This appears in a general way in the varying proportion in which these elements are taken up by the plant, so that while potash, for example, is demanded in relative excess by certain plants, in others soda seems to be the special base requisite to the given changes. And so with the muriate of potash, which Nobbe has shown to be essential to the metastatic changes in buckwheat, and which Dr. Goessmann has also shown to be necessary to similar changes in the diseased peach. When, however, this salt is applied to the pear, though belonging to the same family of plants, the result is not equally satisfactory, for here the action of the chlorine appears to be replaced by sulphuric acid, and so far as we are at present able to determine, the sulphate of potash—which has produced most favorable results in a

number of cases—is the best form of special fertilizer for the treatment of blight. Therefore, in considering the relation of the nutrient elements to these changes, it is as impossible as it is unwise, to attempt to dogmatically formulate a law of general application. Each subject must be treated according to its individual or family characteristics.

Of all the chemical elements known, somewhat less than one-fourth may be regarded as embracing the various constituents of the plant. They are: Mineral, as obtained from the soil, and constituting the inorganic portion of the plant—iron, manganese, lime, magnesia, potash, soda, phosphorus as phosphoric acid, sulphur as sulphuric acid, chlorine, silicon as silicic acid; and combustible, as obtained from the soil and air, constituting the organic portion of the plant—carbon, oxygen, hydrogen, nitrogen.

Of these we may consider the last four as absolutely essential to the constitution and growth of the plant, since they enter into the composition of that which is of fundamental importance—the protoplasm—as well as into the cellular framework. They cannot be eliminated without disorganization of the structure. The mineral constituents are all derived from the soil in solution through the roots. The precise value of each is by no means well known, but certain it is that iron is essential to the proper formation of chlorophyll; silicon seems to exert an important influence as an element of strength; potash is directly connected with the function of assimilation, and so with the formation of starch and sugar, and so probably are both soda and lime; while the acids in general may doubtless be regarded as essential to those changes which are chiefly involved in the transformation of assimilated material as incident to the direct nutrition of parts. The general importance of these elements may be justly inferred not only from their more or less constant presence, but from the injury which follows their exclusion. We have also to consider that failure in the supply of any particular element does not alone cause a direct effect through disturbance of the particular function with which it is connected. The results are far-reaching, and indirectly involve other processes; as for example, exclusion of iron would first of all result in failure of chlorophyll formation. Through this, however, starch and sugar would fail to form; the entire process of assimilation and nutrition would be disturbed; the respiration would become abnormal; the growth would become of a weak and succulent nature, and the whole plant would soon be brought into a condition which would make it the ready prey of parasitic growths, until it finally succumbed to death. We are thus led to see that we may have degrees of special or general debility, corresponding to the degree in which the requirements of growth are met. Complete nutrition is an essential basis of health, and any deviation from it must result in arrest of function in some one or more directions.

Looking yet further to the causes which induce disease, we observe that cultivation at the hands of man exerts a well-defined influence, which is manifested in a great variety of ways, and may be generally illustrated by functional and chemical changes.

It is well known, that under certain conditions plants often exhibit a special activity in one direction of development, to the more or less complete arrest of function in some other direction. This is true in cases where the power of vegetative reproduction through bulbs, offsets, etc., becomes largely developed, with a corresponding abortion of the sexual process. The general tendency of cultivation is to excessive vegetation, and not to reproduction; and conformity to this law is exemplified in the gradual obliteration of seed through conditions of high cultivation, as seen in many of our choicest modern fruits, which retain their abnormal condition just so long as the peculiar circumstances which tended to their development are maintained, but which rapidly revert to their original state when these conditions are withdrawn or an attempt is made to propagate through the seed. Furthermore, the peculiar conditions of cultivation which force the plant rapidly on to a premature development, bring the whole organism into a condition of unstable equilibrium in which the functions seem to be discharged under a state of

high tension, and are not correctly balanced against the adverse influences of environment. This always serves as a predisposing cause of disease, and it is probably safe to say, upon general principles, that the more highly cultivated a plant, or the more the vital equilibrium is disturbed by conditions of growth, the more susceptible is the organism to disease.

While thus on the one hand cultivation may tend to induce certain disorders, on the other hand it may undoubtedly be capable of promoting certain changes whereby disease is not only warded off, but of inducing definite chemical changes for the permanent enhancement of the economic value of the plant or its parts, especially in those cases where the elements of nutrition are wisely controlled. In this connection the results obtained by Dr. Goessman in varying the ash constituents of fruits by cultivation, are most significant. Comparing the ash of the common wild strawberry (*Fragaria vesca*) with that of a cultivated variety (Wilder), the following marked differences were noted:

	Wild.	Cultivated.
Potassium oxide, . . . . .	22.06	49.24
Sodium oxide, . . . . .	29.79	3.23
Calcium oxide, . . . . .	14.88	13.47
Magnesium oxide, . . . . .	Traces.	8.12
Fenic oxide, . . . . .	6.07	1.74
Phosphoric acid, . . . . .	14.47	18.50
Sulphuric acid, . . . . .	12.62	5.66
	<u>99.89</u>	<u>99.96</u>

These relations are most striking, but not more so than those changes actually accomplished in the wild grape (*Vitis labrusca*). A comparison of the ash of the fruit from a wild vine, with that of the fruit from a vine transferred from the same locality to the vineyard, where it was subjected to a careful course of treatment, gives the following:

	Wild.	Cultivated.
Potassium oxide, . . . . .	50.93	62.65
Sodium oxide, . . . . .	0.15	0.85
Calcium oxide, . . . . .	22.23	14.24
Magnesium oxide, . . . . .	5.69	3.92
Fenic oxide, . . . . .	0.79	0.53
Phosphoric acid, . . . . .	17.40	13.18
Insoluble matter, . . . . .	2.92	4.63
	<u>100.00</u>	<u>100.00</u>

These changes, chiefly in the lime, potash and phosphoric acid, were directly correlated to variations in the amount of sugar and to the development of other desirable qualities. They are most suggestive, and furnish ample food for deep reflection.

The influence of nitrogenous foods in stimulating growth is well known, and according to the principles already laid down, this stimulation constantly tends to the reduction of vital energy and the introduction of disease. Under such circumstances, influences which otherwise might long have lain dormant, now become active, and it is under such conditions that parasitic growths often secure their firmest hold to destroy. The judicious application of nitrogenous constituents in the food supply is a necessity of continuous growth; but these elements of food should bear a definite relation to those other constituents of food which tend to more perfect maturity of structure; or, as Lawes and Gilbert express it,\* "A relative excess of nitrogenous supply favors the extended growth of the organs of vegetation, prolonging their development, it may be, until the resources of the plant are exhausted or the season past. On the other hand, a relative excess of mineral manures may bring on premature ripening. It is the proper adaptation of the

\*Mixed Herbage of Perm. Meadow, Phil. Trans. R. Soc. 1882, p. 1221.

two descriptions of supply to the current requirements of the plant and of the season, that gives both full, properly-proportioned and well-matured growth." Nature, unmolested, preserves this relation; but it is seriously disturbed by that system of reckless cropping which man adopts in defiance of both nature and sound business principles. Active diseases arising from the causes thus indicated are only too familiar, as is well known in that disorder now causing such havoc in our peach orchards all over the country. Nor does the influence of the soil cease here, since varying conditions of moisture to an unusual degree, as well as the composition and mechanical condition, must have their well-defined effect, though it may be not to originate a disorder, but simply to hasten and augment the action of other causes.

Meteorological conditions exert an important and often determining influence in the development of disease. Combined warmth and moisture in excess are promotive of great stimulation, thus making it readily succumb to acute disease, and this fact, in connection with the well-known influence of such conditions in the promotion of fungoid parasites, enables us to see that their effect is of a twofold and somewhat far-reaching character, though we may generally regard their action as indirect rather than direct. These conditions are beyond our control, but modern methods and appliances do render it possible for us to lessen their destructive influence in a very appreciable degree. Irrigation will counteract the effects of drouth, but we may even go beyond this, and by the judicious application of manures, "adapting them to the requirements of the plant and of the season," as Lawes says, do much towards checking the undue stimulation of warm, moist weather.

Injuries constitute a most prolific source of functional disorder. They are of such a diversified nature that no general law is applicable to their treatment; it rather becomes necessary to deal first of all with the special agent by which the injury is produced and afterwards with the injury itself. Disorders of this character arising through the agency of insects are not only oftentimes of a very grave nature, but they are sometimes difficult to deal with on account of the rapidity with which they may be distributed, thus becoming far-reaching in their action. In many cases a proper knowledge of the habits of the insect and its mode of development enables us to deal successfully with them. Their action as direct pathogenic agents, as in the production of galls and the destruction of foliage when feeding, is, perhaps, most readily controlled. It is indirectly through ovipositing and the subsequent action of the larvæ that insects often exert their greatest influence and become most difficult to control. As in the common borers, their action is usually very extended, and by operating upon the most highly vitalized tissues of the plant, serves not only to directly reduce the general system, but introduces conditions which rapidly promote decay, and thus is induced a diseased state which otherwise might not have obtained. In the scolytid borer of the peach tree, however, we find a somewhat interesting relation of this insect to disease, since so far as known, it oviposits in the bark of trunk and branches only when the tree has become diseased from other causes; and when other symptoms fail us, it affords a clue to the pathological condition of the subject.

The influence of injuries extends much beyond the action of insects. In fact, it is through the infliction of injury that meteorological conditions sometimes exert their most lasting influence. The action of frost, especially upon those plants which have failed to fully ripen their structure, is a well-known and fruitful source of disorder. Man, likewise, frequently develops conditions which, if not properly controlled, serve as the open door through which disease may enter. The laceration of roots, improper pruning, the breaking of limbs, and a multitude of other injuries, either at the hand of man or arising from accidental causes incident to natural conditions of growth, all produce their well-defined influence. Nature, herself, invariably makes a strong recuperative effort in



such cases, and oftentimes with success, but most generally some assistance at the hand of man is needed for complete results.

Parasitic plants, such as the mistletoe, act as pathogenic agents in a two-fold manner; first, by absorbing from and appropriating to themselves those assimilated materials which the host has provided for its own use; second, by the mechanical action which its growth within the tissues of the host necessarily exerts. The effect in this class of parasites is doubtless to be considered as strictly local, and the treatment becomes simple, since it involves the removal of the parasite with the affected part alone. It is thus not from this class that we may expect the most serious results, but rather from that much larger group of fungoid parasites, which, from their very diminutive size, our want of exact knowledge concerning the life history and mode of development of many of them, and the difficulty of obtaining precise knowledge concerning their mode of action, are not only exceedingly difficult to deal with, but must be numbered among the most far-reaching and destructive of all the influences which combine to promote disease. Indeed, it often seems as if the destructive energy of these organisms was developed inversely as their size, and our knowledge concerning them. This class of organisms, as a whole, will be found to meet the best conditions for growth under the combined influence of excessive warmth and moisture, conditions which, as we have seen, directly promote debility and thus enable these parasites to secure a firmer hold. We have, further, to consider that these organisms occur everywhere, in the sick and in the well, on the living and the dead, but that they seem to particularly predominate whenever the vitality of the host is largely reduced, and especially when death occurs. The mere fact of association by no means establishes their pathogenic character, to determine which it is essential that they be capable of inducing disease in a fully-normal organism, rather than in one which has already become debilitated and diseased from other causes. If, also, we can restore a diseased structure to its normal condition, and still find in the latter the same parasites which accompanied the former, we not only demonstrate that the action of the parasite can be controlled, but that it probably has no direct pathogenic value in that particular case. Such results have been obtained.\* It therefore becomes a most important question to determine whether these organisms have a true pathogenic function, or if they are simply concomitants of disease. In general it may be considered that the growth of one organism upon another is at best a struggle for supremacy which must be decided in favor of that individual which is capable of bringing the greatest vital resources to bear upon its antagonist for the longest time, and there are many facts which would justify us in believing that the influence of these organisms is of a secondary rather than primary nature. At the same time, however, we must recognize that these parasites develop according to the same laws, and that their action is probably similar, whether in the plant or animal; and the various investigations concerning the relation which these organisms bear to animal pathology, offer, therefore, convenient means of examining their probable influence in the promotion of diseases in the plant.

In certain destructive diseases of the animal, it appears to have been well demonstrated that some of these organisms are most active and direct pathogenic agents, and yet it remains an open question as to whether the results are due to the physiological activity of the parasite in breaking down organic substance, or in the production of deleterious compounds which by first causing necrosis, permits the secondary influence of the plants in the promotion of disorganization to come into operation. As Sternberg expresses it,† "It is not alone by invading the blood or tissues that bacteria exhibit pathogenic power. Chemical products evolved during their vital activity, external to the

\* Diseases of Plants. Penhallow. Series III, No. 2, p. 36.

† Bacteria, p. 257.

body, or in abscesses or suppurating wounds, or in the alimentary canal, may doubtless be absorbed and exercise an injurious effect upon the animal economy. Indeed, we have experimental evidence that most potent poisons are produced during putrefactive decomposition of organic matter. The poisons resembling the vegetable alkaloids in their reactions, called ptomaines by Selmi, who first obtained them from a cadaver, are fatal to animals in extremely minute doses. These ptomaines have also been obtained by Gautier from putrid blood and from normal secretions of healthy persons—saliva, blood, etc.” What is thus true in the animal may likewise obtain in the plant.

Whether they arise from the action of these parasites or from other causes, pathological conditions are doubtless to be regarded as developed in the vegetable kingdom in accordance with the same general laws which control them in the animal; the laws which primarily control life are the same in each case, and departures from them must result similarly. Diseases originate in disturbance of the protoplasmic functions, and through this involve the entire organism.

During the period of active vegetation, the leaves and all other green parts of the plant assimilate carbon dioxide and water for the formation of starch, which is not only transported to other parts to meet the immediate requirements of growth, but a certain portion is deposited in the assimilating tissues themselves. Towards the close of the season, as the functions of the leaves gradually cease, no new starch is produced, and that already present finally undergoes complete transformation into oil. At the same time the color of the organ changes by a process of degradation in the chlorophyl. We thus have annually repeated both fatty degeneration and degradation of the chlorophyl pigment, as indicative of and incident to the normal animal maturity of parts. When from unusual conditions, however, these changes are caused to appear at any other than their normal period, they become sure indications of premature development through disordered function; so that when a peach leaf assumes a bright-yellow color in June, when it should be deepest green, we may feel certain, as is actually the case, that all its amylaceous cell contents have undergone fatty degeneration, and that it is an indication of disease which must be heeded. Similar changes are associated with pear blight, and doubtless with other diseases. The experimental evidence obtained by Dr. Cunningham,\* not only demonstrates that such changes may be produced artificially by controlled starvation in both plant and animal, but they serve as a most interesting confirmation of the results obtained in a similar direction with reference to peach yellows.

Atrophoid structures are always indicative of disease. They have been observed to occur in the experiments of Nobbe and Schroeder with buckwheat; they are also known to occur in peach-yellows, of which they constitute one of the characteristic symptoms of advanced development. Such depauperate growths are known to originate in imperfect nutrition of the growing parts, so that whenever present they give us a certain clew as to the general course of treatment to be followed.

From these considerations it is obvious that we cannot hope to reach any correct diagnosis upon the basis of one or two external symptoms alone; we must in general go much beyond that, and have due regard for those which are internal as well. We now have to consider by what means a disease which originates locally may finally involve the entire system; by what general process it may be distributed through the organism.

In the case of fungoid parasites, it is not difficult to see that, with the rapid extension of the mycelial filaments through the organism and the very abundant development of spores, not only are conditions developed in the plant which favor the accelerated action of the parasite, but if the latter possess pathogenic power, disease arises constantly in new centers, and rapidly spreads through the whole structure. Owing largely to the physical

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\*Quarterly Journal Microscopical Science, January, 1880.

obstacles opposed to the extension of the parasite, this, too, frequently fails to satisfactorily account for the very rapid diffusion of disorder throughout the system.

In the animal, the nutrient fluid of the body circulates through a definite system of channels, being distributed from a fixed center to which it afterwards returns from most intimate contact with the most remote parts. In its circulation it serves both as the medium through which nutriment is conveyed to the growing parts, and effete matter is returned for expulsion from the system. It therefore serves as a most direct and favorable channel through which disease may be rapidly and effectively distributed to all parts of the body, and suggests a similar distribution in plants. But here analogy fails us. In the plant there is no definite system of channels through which the fluids flow and return, neither is there a fixed center of distribution. As the food elements are absorbed from the soil, in watery solution, the crude sap passes upward through the various tissues, cells, and even cell-walls, in accordance with the law of osmosis, until it reaches the leaves, where, under the influence of light and chlorophyl, its chemical composition is changed, and it then passes to the various growing parts by the same physical laws of distribution. It therefore becomes obvious that anything of the nature of pathogenic germs could not be thus distributed on account of the physical obstacles opposed, and if disease does become distributed through the agency of the sap, it must be through abnormal chemical constitution of the latter, which directly affects and influences the various dependent physiological processes, and thus the disease becomes one of nutrition.

One other very important means of distribution requires examination. All the processes of growth, all the characteristics of the plant and its power to respond to external influences, are centered in the protoplasm to so high a degree that it alone, physiologically, is the cell upon which all else depends. Whatever operates to disturb the functional activity of the plant, must operate through its component cells; and the degree to which the organism is involved will depend upon the number of cells acted upon by the disturbing influence. But when there is an impenetrable cell-wall, and the disease is not one of nutrition, but arises from the action of some pathogenic germ, how may one cell succumb to the influence of those in its vicinity? During his examination of the endosperm cells of certain seeds, in 1881, Dr. Pangel determined the presence of a system of channels in the walls, through which a continuity of the protoplasmic masses in adjoining cells was established. About the same time, Strasburger, Fromman and others determined a similar continuity in other plants; and from that time on to the present a very large number of confirmatory facts have been obtained, especially by Gardiner within the last two years. They are of such a nature as not only to establish the law of continuity of protoplasm, but render it highly probable that it is applicable to all living vegetable tissues;\* so that, as Sachs expresses it, "Every plant, however highly organized, is fundamentally a protoplasmic body, forming a connected whole, which, as it grows on, is externally clothed by a cell membrane, and internally traversed by innumerable transverse and longitudinal walls." We have in this, therefore, a most direct channel through which all parts of the plant are brought into the most active sympathy, and a means by which disease, from whatever cause it may arise, can be most rapidly and effectually distributed.

Last of all, we must direct brief attention to those general principles which should guide us in the treatment of disease, and it is hardly necessary to say that the first essential is to obtain a correct diagnosis, otherwise we may continue to grope hopelessly in the dark with only discouragement as a reward. As prevention is always cheaper and better than cure, let all the operations connected with pruning and transplanting be controlled by and executed in accordance with correct principles, bearing in mind that

\*Bot. Centralbl., XIV, 1883, pp. 89 and 121; Proc. R. Soc., XXXV, 1883, p. 163; *ibid.*, XXXIV, 1882, p. 272; Quart. Jrl. Mic. Sc., Oct., 1882; Jahrb. Wiss. Bot. XII, 1880, p. 170.

nature has established certain relations between the wood and the leaf, which, if disturbed, will operate against the health of the plant; also that a clean cut always heals most readily, while laceration introduces the elements of rapid disorganization.

As a preliminary in the treatment of any disease, I feel that the maintenance of full constitutional vigor is a point which cannot be too fully insisted upon, as it is the one of all others which appears to be first overlooked. As shown, this may be accomplished by judicious feeding, with the application of such special elements of food as the case may require. Where this is done at the outset with due regard to the particular case, it will be possible to either effect a direct cure or so bring the disorder under control that other applications will be efficacious; for we must keep in mind what has long since come to be well recognized, that a vigorous constitution is the most solid basis on which to combat disease, and a natural remedy to which all the artificial applications of man are but aids. It would therefore be useless to continue the destruction of parasites by special treatment until such invigoration has been accomplished. The results would be of the most superficial and temporary nature, since the conditions, if not the actual cause, which favor the disease, are still present.

Special applications, such as strong lye or lime, which are designed to act directly upon the parasite, must be used with caution. Their value depends upon their ability to destroy cellular structure and vitality, and it requires no very great degree of penetration to see that the action which is exerted upon the parasite must also be exerted upon the tissues of the host, and thus that which is designed as a benefit may and often does do as much harm as, if not more than, the parasite itself—since it strengthens and extends those very conditions favorable to disintegration and parasitic growth.

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[From advance sheets Report of American Horticultural Society for 1884.]

## FUNGOID DISEASES OF THE STRAWBERRY.

BY F. S. EARLE, COBDEN, ILL.

Like nearly all species of flowering plants, the strawberry furnishes a home to several of those minute forms of vegetation known as fungi. Of these a portion are true parasites, attacking the green leaves or other parts of the living plant, while others are saprophytes, developing only on such parts as are dead or decaying.

During the last two years I have observed ten kinds of fungi as occurring on strawberry plants in southern Illinois, and the list can doubtless be considerably increased by further investigation; but so far only three of them have proved injurious enough to deserve a notice under the head of "Fungoid Diseases." It may be of interest as showing the great need of more work in this much-neglected but very important branch of study, to note that of the ten species mentioned above, five, or exactly one-half of them, proved to be new and undescribed.

### THE WHITE RUST.

The most important of the injurious species is *Ramularia tulamei*, Sacc. This occurs on wild and cultivated plants in all parts of the country, from the New England States to California and Oregon, causing the diseased condition known in different sections as "rust," "blight," or "sun-scald." In order to distinguish it from the following species, I have called this the white rust. Its presence on the leaf is usually indicated at first by a reddish blotch, and later by a white spot about an eighth of an inch in diameter,

surrounded by a reddish border. Under the microscope this white spot is seen to be covered by a great number of simple oblong cells borne on a short stalk. These are the spores or reproductive bodies of the fungus, and under proper conditions serve to multiply it very rapidly. On young leaves in the spring when the fungus is developing rapidly, this red color does not appear, and the spots look as if scorched by fire. If only a few of these spots are present, the leaf does not seem to be much injured, and the general vigor of the plant is unimpaired. The greatest damage is caused when it attacks the calyx and stems of the growing fruit, as it causes them to become dry and withered, and the berries, if they mature at all, are small in size, and have a dry, seedy look that is not attractive.

This disease is most active in warm wet weather during the period after blooming, and before the ripening of the crop; but its effects are most evident when such a season is followed by a long drouth during the harvest, as then the diminished leaf surface cannot supply sufficient sap to perfect the crop, and the dried fruit stalks prevent its free flow to the ripening berry.

As before stated, this fungus occurs in all parts of the country, yet it only seems to have become injurious enough to attract attention in those sections where large fields of strawberries have been grown continuously in the same neighborhood for a number of years. Other things being equal, it causes more damage toward the southern, and less toward the northern border of the strawberry belt. With us in southern Illinois it has for several years past caused very considerable injury, and it is one of the worst of the many enemies with which we have to contend. It is, however, very difficult to estimate the per cent. of damage caused in any given season, as its action is quite local, some fields being badly injured while others near by are but slightly affected; and besides in many cases losses occasioned by the tarnished plant bug (*Capsus oblineatus*, Say) have been reported as caused by rust.

Some varieties seem to withstand its attacks much better than others, but none are entirely free from it. This is perhaps largely a question of location, for varieties that succeed well in some localities are often utter failures in others on account of this disease. The Wilson's Albany has for the last few years with us probably suffered more than any other variety in general cultivation. Downing, Cumberland Triumph and Capt. Jack also rust badly, while so far the Crescent has escaped with but little injury. Bidwell is also comparatively freer from rust. In many other localities the Wilson's Albany is put at the head of the list for hardiness and ability to withstand injury.

Mr. J. T. Lovett, of Little Silver, N. J., is of the opinion that varieties having a large share of foreign blood are less liable to rust than those descended from our native stock; and he also observes that some varieties like Manchester, that succeed well on light, sandy soil, rust badly on heavy clay, while others like Chas. Downing and Kentucky that succeed on clay, rust badly on sandy soil.

Mr. J. Decker, of Jefferson county, Ky., says that light-colored berries, such as Chas. Downing, Monarch, and Cumberland Triumph, are more likely to rust than dark-colored ones like Wilson's Albany and Crescent.

So far as I know, the only remedy that has been proposed for this disease consists in dusting the plants with lime. This has been practiced for some years with good success, by Hale Bros., of Connecticut, and by Mr. Rosaman, of Tennessee. We tried it last spring, in a small way, with apparently good results, and shall repeat the experiment next season. This remedy is so easily and cheaply applied that I hope it will be tried extensively the coming year, and the results reported to this Society. I would advise dusting the plants lightly when the leaves first start in the spring, and repeating every two or three weeks until the fruit is nearly mature.

Mulching the ground around the plants is also of considerable use in preventing this

disease. Strips left unmulched across a field are frequently quite red with it, while the adjoining mulched plants are but little affected. The Southern plan, of allowing crab-grass to grow and fall down among the plants, is of advantage in this respect, for plants growing up through such a mulch are almost always clean and bright.

#### THE BLACK RUST.

The next species in order of importance is *Glaeosporium potentillae*, Ouds, which I have called the "black rust." This has perhaps as wide a geographical range as the last, but so far its injuries have attracted but little attention, or they have been confounded with those caused by the other species.

In its first stages it is sometimes difficult to distinguish between this and the white rust; but instead of developing white spots in the center, the reddish blotches show at length a number of very minute black pustules bursting up through the epidermis of the leaf. Under the microscope these are found to contain great numbers of curiously curved two-celled spores. Unlike those of the white rust, these are formed within the structure of the leaf, and they are finally liberated by the rupturing of the pustule. When badly affected, the leaves will often turn yellow and be thickly sprinkled with these minute black dots. Frequently the plants may have quite a number of leaves in this condition, and still remain vigorous and show very little indication of disease. At other times, however, a peculiar abnormal condition is induced, that has been aptly described as the "strawberry yellows." The older leaves die down and lie close to the ground, while the younger ones have a spindling upright growth, and a peculiar sickly yellow color.

This condition sometimes appears in newly-set fields during the summer, arresting growth and completely ruining the plants as far as it extends. In bearing fields it usually makes its appearance when the plants first start in the spring, destroying the crop, and often killing the plants outright. Sometimes, however, the plants seem to recover, and make a feeble growth later in the season. This disease has proved with us far more destructive than the other, but fortunately it has so far been restricted to somewhat limited areas, and to a few rather tender varieties. It has destroyed considerable fields of Manchester and Great American for us, and compelled us to abandon the culture of these varieties. I have also seen touches of it on Crescent, Sharpless, Miner, and several other varieties, but so far it has done them no practical harm.

Early in June I received specimens of Manchester leaves from Mr. Henry Schnell, of Glasgow, Mo., showing the black rust. He reported that it was the only kind showing the disease, and that it did not seem to injure the fruit. About the first of September he wrote again, saying that about one-third of his this-spring's planting of Crescents were dying down, and making no runners. From the specimens sent I judge that this, too, was a case of black rust.

Mr. G. Cowing, of Muncie, Ind., reports a peculiar disease, which he estimates has damaged the strawberry crop of his section to the extent of eight or ten per cent. From his description this also seems to be the black rust. He says it is much worse on badly-drained land, and on varieties with light-colored leaves, such as Crescent, Champion, and Bidwell, than on those with dark foliage, like Wilson's Albany, Duncan, and Cumberland Triumph. He thinks it worse on newly-planted fields, and on those that are heavily mulched.

From a brief description given by Mr. H. M. Engle, of Marietta, Pa., I judge that this disease is also known in that State; but though during last summer I received communications in regard to strawberry diseases from twenty States and Provinces, I received no hint of its occurrence except at the localities just mentioned. I should be glad to hear from the members of this Society if it has been more widely observed.

I do not know that any remedies have been tried for this disease.

Before leaving the subject of these rust-producing fungi, I wish to say that both these

forms belong to the class known as incomplete, or imperfect, fungi. That is, they are considered to be only the first, or immature forms of species that do not reach their full development till later in the season; so it is quite possible that some of the species referred to at the beginning of this article as only occurring on dead and decaying leaves, and therefore not injurious, may prove to be only the continued development of these same rusts. The life history of many of the fungi is exceedingly complicated, and the connection between the different forms that the same species assumes at different stages of its development has only been completely traced in a few limited groups; yet we cannot hope to clearly understand their action, nor successfully combat their attacks, till this difficult task is accomplished for all our injurious species. The importance of this study to agriculture and horticulture cannot be over-estimated, but, from the nature of the difficulties to be surmounted, it will proceed very slowly in the future, as it has in the past, if it is left to the unaided exertions of private students. The importance of economic entomology is now so well understood that the General Government, as well as many of the States, appoint special officers and provide them with all the necessary aids for prosecuting this study, and we all are convinced that their labors have repaid many times the outlay. Why should not the equally important and far more difficult study of economic fungology receive at least equal recognition and support?

#### THE ROOT ROT.

The only species remaining to be considered does not attack the leaves, but forms a white, mouldy coating on the roots and crowns, causing them to decay. This coating consists of very delicate white threads, more or less felted together. It is quite difficult to make out their true character under the microscope, as they break in pieces at the slightest touch; but Prof. Burrill, of Champaign, Ill., well known for his researches in this line of study, has determined them to consist of chains of the minute cells of an undescribed species of *Baccillus*. This genus includes a number of the most destructive of those lowest forms of vegetable life popularly known as bacteria. It has long been known that many of the most fatal diseases of man and the domestic animals are caused by these minute organisms, but Prof. Burrill, in his able investigation of the causes of pear blight, was the first to demonstrate that they also cause diseases of plants; and we see in this root rot of the strawberry another instance of the same kind.

It occurs quite frequently in southern Illinois, especially in old, neglected fields, and, together with the crown borer and the root worms, does much to prevent the profitable keeping over of plantations for more than one or two crops. This disease has been observed in Kentucky by both Mr. Decker and Mr. Samuels, but has not been reported by any of my other correspondents.

So far as I know, no remedies have been tried for it, but it would be a wise precaution in setting new fields to use plants that are known to be free from it.

In closing these hasty notes, I wish again to call the attention of the Society to the importance of securing some provision for the systematic study of the fungi, and their relation to our agricultural and horticultural interests. This could perhaps be brought about through the instrumentality of the Department of Agriculture, and in fact a beginning has already been made in this direction, as is shown by the carefully-prepared series of water-color drawings of fungi to be seen in the exhibit of that department in the Government building. If the measure for establishing experiment stations in the different States, that was advocated by this Society at its meeting here two years ago, should become a law, then this subject could receive the attention due to its importance by employing a competent person at each station to collect material, and make experiments under the direction of a central office, connected with the Department of Agriculture if you please, that should be provided with all the aids for the most thorough investigations.

Prof. Riley, the Entomologist of the Department of Agriculture, has created a very similar system for conducting his researches, having his assistants located in different parts of the country, and assigning them such duties as by their location or peculiar abilities they may be best fitted for.

Such an organization as is here briefly outlined, once established, and we could hope in time for results that would be of the greatest importance to the material interests of the country.

## STIMULATING OLD BEARING APPLE ORCHARDS.

COMPILATION BY THE SECRETARY.

The comparative value of barnyard manure and wood ashes being questioned by Mr. Wm. Meixell, of Parsons, Kansas, the inquiry was submitted to Dr. R. C. Kedzie, of Lansing, Mich., who is generally considered standard authority on such matters. The following reply was sent to the Secretary's office:

*G. C. Brackett, Secretary Kansas State Horticultural Society*—DEAR SIR: Your favor of 16th inst. is received, in which you ask the comparative value of wood ashes and barnyard manure as fertilizers of land, ton for ton, when applied to orchards—apple, peach, pear, or cherry? And what result of composting the two substances, as related to their properties?

### BARNYARD MANURE

Is so variable a material that it is impossible to give any one price that will cover its value in all cases. Its value will vary with the kind and condition of the animal, the nature of its food, the relative amount of straw and corn-stalks mixed with it, and the amount of soluble materials removed by rain. For this discussion I will take fresh horse-dung as a standard, the horse having a mixed feed of one part oats to three parts meadow hay, and the dung free from all stable litter. This dung contains 75 per cent. of water, 24 per cent. of ash, and 6-10 of 1 per cent. of nitrogen. A ton of such manure would contain 12 pounds of nitrogen, worth \$2.40; and 50 pounds ash, containing, in addition to the lime, magnesia, sulphates, etc., 11.6 pounds of potash, worth 77c., and 4.9 pounds of phosphoric acid, worth 61c.; or a total value of \$3.78 per ton—estimating these three materials at commercial rates. This calculation is made on the assumption that the phosphoric acid is all soluble in water, and that the nitrogen is as valuable for fruit trees as it is for field crops—both propositions somewhat doubtful.

### WOOD ASHES

Represent all the mineral elements of vegetable growth, and contain everything a farmer must give his crops in the way of manure, with the single exception of nitrogen. Wood ashes will vary in composition and value with the kind of wood and the part of the tree. I will take the ash of the body wood of the beech tree, as representing the average of wood ashes. A ton of such ashes contains 320 pounds of potash, worth \$16, and 105 pounds of phosphoric acid, (insoluble,) worth \$5.25. Omitting all the other ash constituents, which have some value in addition, the potash and phosphoric acid in a ton of such wood ashes are worth \$21.25, or nearly six times the value of a ton of fresh horse-dung. For orchards, I regard the ashes as worth more than six times the value of barnyard manure, ton for ton.

When barnyard manure is composted with wood ashes, the coarse vegetable material and litter is rapidly broken down, and the material speedily fitted for use, but there is some loss of nitrogen, in the form of ammonia; there will be no loss of mineral matter, if kept from rain and water currents.

Yours faithfully,

R. C. KEDZIE.

In reply to the question of the best means for enriching orchard lands by green manuring, I have the following to offer:

LANSING, MICHIGAN, February 28, 1885.

*G. C. Brackett, Secretary Kansas State Horticultural Society*—DEAR SIR: Your favor of the 25th inst. is just received, reminding me of your request of last December for an article on Manure for the Orchard. I have nourished a hope all winter that I could find time to write such an article; but so many things pressed upon me for immediate attention, that I have found no opportunity.

With your large grain production and extensive feeding of stock for market, you ought to have an abundant supply of stable manure of the best quality; but I need not enlarge on so obvious a statement



and conclusion. If for any reason stock-feeding and fruit-growing cannot be united, directly or indirectly, and you find commercial manures too expensive, then you must turn your attention to plant growth as the source for accumulating plant food by *green manuring*. All things considered, this is the cheapest form of manuring, except where you secure some indirect means of profit, as in stock-feeding. You say you get good results in the use of red clover as a manurial crop, but that it is liable to fail from drouth. In this case, some other rapidly-growing leguminous plant, capable of enduring drouth, should be selected. It is possible that the cow pea would fill the place. Have you experimented with *doura*, or other drouth-proof plants? I think experiments in regard to the kind of plants best capable of enduring dry weather and affording the best results for green manuring, would be of great value in Kansas; but this is for Kansas to do.

The fact that humus in the soil mitigates the effect of dry weather, is one reason for the use of green manuring. Humus has the power of absorbing moisture from the air greater than any other constituent of the soil: it also retains moisture in the soil more strongly.

While wood ashes and ashes of all vegetable substances are of great value for manure, the coal ashes are without value for manure. They may be of some value from their physical properties, but none from their chemical composition.

Regretting that I have not time to write more on this subject, I remain,

Yours faithfully, R. C. KEDZIE.

How to keep up the vigor of old bearing fruit trees, and maintain the size and quality of their product, to enable the owner to successfully compete in our markets with the product of younger orchards, is one of the most important questions to be solved. The continuous cropping of land must sooner or later exhaust the elements of plant food which nature has provided, and with that exhaustion the crops fail. In no class of products is that exhaustion more rapidly occurring than with our orchard fruits. A tree at fifteen years of age may cover a breadth of land twenty feet square, and yield in a single year ten to fifteen bushels of apples, which at least calculation will weigh 40 pounds, and as often 45 pounds per bushel, or an aggregate of 400 to 600 pounds of matter, which has been largely taken from the small compass of twenty feet square. This for a single year; whereas a continuation of such crops through a period of several years would aggregate to an enormous amount of soil element, or plant food, extracted from the land, of which scarcely a tithe is ever returned. It is embodied in the wood of the developing tree as fixed matter, and in the crop of fruit which is annually produced and borne away. This cannot be continued without incurring the risk of ruin. That the sustenance demanded for success of the orchard must be artificially supplied, is not a question admitting of discussion. It is a palpable fact, and the only question for orchardists to solve is: What is the best and cheapest material, and the best means for its application? Barnyard manures are not always available to the extent needed, nor are wood ashes, which are shown to be the richest in all the elements needed for plant nutrition. If one ton of wood ashes contains as much valuable matter for tree growth as six tons of stable manure, then it costs five times as much labor and time to use barnyard manure to accomplish the same result as one ton of ashes. Their economy would lead to the choosing of wood ashes, as between these two.

But as stated, neither of these substances—or we may say both—can be obtained in sufficient quantities to meet the requirements of extensive orcharding. Under such circumstances it is important that we consider the advantages of other substances and means within our reach, as green manuring, or a restoration of fertility by turning growing crops under, that by their decay plant nutriment may be added to and incorporated with the land. The question arises, can this means be depended on alone to accomplish the result so much needed? We may use clover, grasses, or other species of plants, for a crop of green manure. These are dependent upon nutriment already in the land suitable for plant growth, and the absorption of material from the atmosphere for the supply of their own development. Four tons per acre is more than an average yield of such crops even in a fully-matured state, which would aggregate 8,000 pounds, and which would represent the amount of matter, when plowed under, returned to each acre thus treated as fertilizing material. One acre of orchard contains, at recommended distances,

fifty-six trees, and yielding an average of ten bushels of apples each, weighing forty pounds per bushel, would give an aggregate weight of 22,400 pounds to an acre, which has been largely extracted from the land through the functions of the trees. The formula, then, would be thus: 8,000 pounds of green manure added to 22,400 pounds of fruit extracted from the land. In this we have not allowed for any exhaustion of the land in material for annual wood growth, which becomes fixed matter.

But it will be argued that fully three-fourths of the product of fruit is water. Admit it; but at the same time concede that the same proportion of water exists in the product of plants grown for green manuring, and then can there be any other conclusion than that the land is being continually impoverished, and its fertility reduced to a ruinous state?

But there is still another resource which is available for immediate use, viz., commercial manures. These contain in concentrated form the main elements required for plant growth, are easily transported and distributed, and by determining the condition of the land and the requirements of an orchard, they may be applied in specific quantity to maintain largely the fertility against the exhaustion.

It is clearly evident from years of experience and observation, that orchard lands require close and prompt attention as well in Kansas as in other States; and that in small or extensive operations, thorough cultivation and all the manures—barnyard, wood ashes, green manures, and to a certain extent some of the commercial class—will be required to maintain the vigor of tree and quality of product.

#### DRIED BLOOD AS A STIMULANT FOR SMALL-FRUIT PLANTATIONS.

For several years past this substance has been used with gratifying results. It increases the vigor of plant, size and quality of the berry, and amount of the crop of strawberries. The following questions were submitted to Maj. Frank Holsinger, of Rosedale, who with Mr. Hopkins, of Kansas City, and G. F. Espenlaub, were the first to bring a knowledge of the value of dried blood to public notice, which was in 1880.

##### QUESTIONS.

1. Do the results in 1883 and 1884 encourage the use of dried blood as a manure for small-fruit plantations?
2. Would you recommend its application to land before planting?
3. Is it valuable to other small-fruit plants than the strawberry?

In answer, Maj. Holsinger says: "All experiments with dried blood have been perfectly satisfactory, except in cases where used too freely. No excess of the rate of 400 pounds to an acre is safe to practice, and it should be evenly distributed by broadcast application. I am certain that it will produce excellent results when used in the preparation of the land for planting, as such experiments amply prove. It has been applied to strawberry plantations when the plants were in bloom, to raspberry when two years planted, blackberry two and three years planted, with equally satisfactory results. It can be purchased at \$2 per 100 pounds, or \$20 per ton, which makes it the cheapest and most valuable manure for small fruits."

#### RUSSIAN APPLES.

BY THE SECRETARY.

Are they preferable to our American varieties, either in character of tree or quality of fruit? And even if equal, are they worth forty to sixty cents apiece, when such varieties as constitute the approved list for Kansas can be bought at any nursery at eight to

fifteen cents each? Let us go back to the first planting of this class of apples in Kansas, and follow their history to the present time, and weigh the results in the scale of experience. Several small lots of these trees were first planted in Douglas county, in 1868, and fruited in 1872. Their growth was dwarfish, and they never attained to a tree of any size; suffered serious injury in drouths and the hot weather which generally prevails during August; subject to spur and twig blight, when nearly all of our American varieties escaped; at the age of ten to twelve years from planting not one remained alive, and their epitaph should be, "*Died in their youth, in a foreign land, from disease engendered through inability to adapt themselves to the uncongenial conditions of soil and climate of these Western prairies.*" The fruit borne upon these trees was scarce, yet on some trees was beautiful, having a waxen appearance, which was shaded with blushed cheeks; and some were handsomely striped and splashed with crimson. None were above a medium, but most were inferior in size; flavor insipid in some, and in others severely tart. None possessed a degree of excellence fitting them for any other purpose than cooking.

Again, in 1877 a combination of tree peddlers formed in Pennsylvania came into the State and canvassed the southern portion of Leavenworth and Jefferson counties, the whole of Douglas, Franklin, and Johnson, and portions of Anderson and Osage counties. Their stock was largely "*recently imported Russian varieties*" of apple trees, which had been propagated and nursery-grown at various points in western New York. Their list of varieties was read to their customers, but seldom appeared in their printed order sheet, and so shy were they towards those with whom they sought trade that it was exceedingly difficult for the purchaser to obtain a copy. Having canvassed the above-named counties, they worked the counties of Lyon, Chase, and Marion, and estimated their aggregate sales in the State at \$30,000. A successful delivery of the orders in Douglas county was defeated through an exposure of the worthlessness of the class by the writer; in Franklin and Anderson counties, by the Hon. H. P. Welsh, of Ottawa; and in Chase and Marion counties, by the efforts of that veteran horticulturist, J. W. Byram, of Cedar Point.

In the spring of 1873, the Agricultural Department at Washington, D. C., disseminated a large lot of cions of this class of apples in many of the States. Kansas received her quota, and the writer was furnished cions of about one hundred varieties, which were carefully engrafted on bearing orchard trees, for the purpose of immediately proving their character and adaptation to our climate. Most of these cions united and made a fair growth during the first season, formed the terminal bud early, and apparently were in fine condition to endure the coming winter. The following spring many of them did not leave out, while those that did made a fair start and wood growth until about the first of July, when on some of them the leaves seared and dropped, while others blighted entirely. Not more than a score survived the trying ordeal of that hot summer, and these were so reduced in vitality that they perished with the cold of the succeeding winter. So endeth the chapter relating to efforts to introduce this class of apples in Kansas, until the present year, of which mention will be made in the conclusion.

Referring to the recommended fruit list of the American Pomological Society, we find 330 varieties of apples mentioned as worthy of trial and general culture. Of this number, 300 varieties are of American origin, 8 English, 9 French, 6 German, 2 Nova Scotia, 1 Canada, and only 4 Russian. These four are the Alexander, Duchess of Oldenburg, Tetofsky, and Yellow Transparent. Of the 49 States, Territories and Provinces assisting in making the list, 21 recommend the Alexander, 27 the Duchess of Oldenburg, 9 the Tetofsky, and 4 the Yellow Transparent.

Here then are only 30 of the 330 varieties recommended, which have a foreign origin, while the balance (300) are of American origin, and none of the foreign number rank among our leading and prominently valuable sorts.

Is it not remarkably strange that of foreign varieties, and especially those possessing

such high character of quality and fruitfulness—such remarkable powers for resistance of heat and cold, insect attacks, and longevity, as is claimed for the Russian varieties, so small a number (only 4) have been considered worthy a recommendation in so extensive a list (330) by the savants who constitute the membership of our National Pomological Society? The voted apple list recommended for our State is the result of twenty years of careful experimentation by thoroughly competent fruit growers in each county embraced in the fruit districts; and yet in this list we find only two varieties of the class in question, viz.: Red Astrachan and Duchess of Oldenburg—the former only recommended. These are both early-ripening varieties, and are not equal to those of American origin, and ripening at the same season. The Duchess of Oldenburg is a very tart, coarse apple, and only fit for culinary purposes. The Red Astrachan has no remarkable feature to recommend it, other than its appearance. It is defective in tree when planted on open prairie lands, and short-lived generally.

Is it from a lack of introduction of others of Russian favorites, that the number is so small on our State list? Certainly not. As is seen in the history preceding, quite an extensive lot has been planted in the State. It would rather seem that they have not proven worthy of favorable mention by the makers of that list. Although the Secretary of the State Horticultural Society has repeatedly, in his annual circular to the Vice Presidents of the Society in each county of the State, called for reports on newly-introduced varieties of fruit, no mention has ever been made of the planting of any new varieties of Russian apples.

In view of these facts, are we not justified in the conclusion that they have been an absolute failure?—for does any one believe that had the trees developed the valuable traits of extreme hardiness and productiveness, and fruit of the high degree of excellence claimed for them, that the proprietors of such plantations could have kept the community in ignorance of their merits through so long a period? Again, if this class of trees are so extremely hardy, and in their constitution so peculiarly adapted to the climate of these Western prairies, the plant of 1874 should still be in existence, and developed into sturdy, healthy trees; and if so profuse in bearing, the product would be found in our markets and on the exhibition tables of local and State fairs. Yet this has never occurred, excepting of the two aboved named, and occasionally a Tetofsky at our fairs.

A special circular asking for information relating to this class of apples was sent out from the office of Secretary of the Kansas State Horticultural Society, May 10, 1884, which brought out a response from thirty-five counties in which there had been planted and tested varieties of this class of apples recommended as most promising as to hardiness and productiveness, and especially capable of resisting the attacks of borers and extremes of weather; and in nearly every case reported, "disappointment has been the result in tree and fruit. They have not proven so hardy as our common American varieties, and the fruit not equal in quality to the poorest varieties recommended in the fruit list of the State Horticultural Society." Many of the reporters condemn them as a fraud, and their sale an *infamous swindle* upon the people. Nine-tenths died during the first year.

A review of the reports of the Nebraska Horticultural Society shows that the results with the Russian varieties of apples are quite similar to that in Kansas.

An intelligent orchardist at Rock Bluff, Nebraska, says: "I bought fifty Russian apple trees at a high price. The trees were poor, and the fruit the poorest. Beware of anything [such] peddlers recommend."

Another says: "The Russian apples are like the men who peddle them and kindred new things—humbugs. Buy nothing from such peddlers."

An ex-president says: "After experimenting largely, I have found, but one Russian that might be called a winter apple."

In Iowa probably this class of apples has received more extensive trial than in any

other prairie State. In response to a letter of inquiry, I have the following from a prominent fruit-grower of that State and an ex-president of its State Horticultural Society: "About eight years ago, the Agricultural Department at Washington, D. C., sent a large number of Russian-apple cions to our State Horticultural Society. They were grafted into bearing trees, and many of them have borne fruit. I have had a chance to test all of them, and so far I have not found a single variety that is worth growing. You do not want the Russian apples in Kansas. They are not more hardy than many of our American sorts."

Another extensive experimenter with this class of apples in Iowa says: "I believe I have so far fruited more varieties of the Russian apples than any man in Iowa, and I know of none that would be of special value to your people. There is not the slightest reason for the sweeping declarations made in their favor, nor are such declarations warranted by experiments in this or any other State. You are right when you say that the climatic conditions on our Western prairies are unlike those in Russia, and that all experience proves the non-adaptation of Russian varieties of apples to your prairie regions in Kansas."

On this point Prof. J. S. Budd, who is one of the strongest advocates for the introduction of Russian fruits, says, in a recent letter to the writer: "Truly, as said in your State Horticultural Society's [Kansas] reports, the Russian fruits are for the far north." I am of the opinion that planters, even in the far north, will find much disappointment in their efforts to grow this class of fruit, as already they are pronounced worthless in the far-northern State of Maine, and the intelligent fruit men even there, as in this and other States, are basing their main hopes for suitable varieties for the conditions existing in localities, upon the production of new native seedlings raised under the environments and vicissitudes of their respective climates.

Furthermore, being aware that the nursery firm of Messrs. Ellwanger & Barry, Rochester, N. Y., had expended a large amount of money and labor for the purpose of determining the value of Russian apples in their adaptation to the United States, a letter of inquiry was addressed to Mr. P. Barry, junior member, also chairman of the Fruit Committee of the American Pomological Society, in answer to which I have the following: "I find, upon looking into the Russian-apple record, that our two catalogues, No. 24 and No. 25, give all the information we have on the subject. Our people think so little of them that, with two or three exceptions, they have ceased to propagate them."

The following is the information which Mr. Barry refers to in his letter, clipped from catalogue No. 24:

*"Russian Apples—Offered for the First Time in 1878.*—Some years ago we received from the Imperial Gardens of Russia a collection of apples, which, we were informed, had been selected with great care from the best sorts cultivated in that country. Subsequently we received another collection, said to be of the best Russian varieties, from the Agricultural Department at Washington. We have been testing these collections in our experimental orchard. Many of them have fruited some two or three years. Whilst we cannot say that any of them will rank in quality with our best apples, they are at least fair, and we think all are worthy of a trial in those localities where only very hardy varieties succeed. Nearly all are moderate or poor growers. Season of ripening, August and September."

[From catalogue No. 25.] *"Russian Apples.*—We have spared neither trouble nor expense to ascertain the true value of these apples. After having fruited many of them several times upon our grounds, we are of the opinion that few if any will be valuable for this or similar climates, where the choicest apples can be grown successfully. But in the colder regions of this country, where only the hardest varieties succeed, they will undoubtedly prove desirable. All the sorts which have borne fruit thus far are summer or early-fall apples. One or two varieties, said to mature in winter, have not fruited with us yet."

From the Michigan Horticultural Society Report for 1883, I copy the following. In a private letter to the Secretary, Mr. Barry says: "I have felt much interest in the Russian apples, hoping that we would find among them varieties that would be valuable in those sections of our country requiring extreme hardiness. I still hope so; but after

fruiting a large number I cannot say that I know of one that would be worthy of cultivation in New York or Michigan. We have been testing a collection of the more recently introduced Russian varieties, so called, since 1872, and have not found half a dozen in all that would seem worthy of extensive culture anywhere."

There is no institution in the United States—and I may safely say in the world—which has so thoroughly organized a system for experimentation with fruits as this firm. With an unstinted capital, and extensive practical knowledge of fruits and their propagation, and great integrity and honor in its proprietors, it has become the most extensive and reliable firm engaged in nursery-growing of fruits. Nothing is allowed to receive a recommendation from them which has not proven, under their own treatment, to possess values worthy of dissemination. And when the firm of Ellwanger & Barry publish the result of their investigation of any class of fruits, or when they declare a variety of fruit to be worthy or unworthy, it can be relied upon as having been submitted to as thorough a test as possible with man.

The scheme of trafficking in this class of fruit is a speculative one, and with tree agents largely a swindle. It is often found by investigation, that the nursery companies they represent are not propagating, nor have they such varieties of apples among their stock, as are offered by their agents; and in some instances I have found them surprised to learn that their agents are offering them. Some nurserymen, in publicly defending their character from the swindling operations of their agents, say: "We have better fruits for our patrons than these highly-extolled Russian varieties, and they are such as are common in every nursery, and can be had at reasonable rates."

## HORTICULTURAL CHEMISTRY.

BY PROF. E. H. S. BAILEY, STATE UNIVERSITY, LAWRENCE.

All bodies may be divided into two great classes—those consisting mostly of mineral constituents, and those consisting of organic constituents. In the earth and soil the former are the most abundant, while in plants and animals there is an excess of so-called organic matter. Animal tissue contains more nitrogen, and vegetable matter more carbon.

In order to understand the true composition of vegetable matter, let us burn a piece of wood. A large portion of it, about 99 per cent., goes off into the air and is soon invisible; a small portion, about 1 per cent., remains as ash.

That which was volatilized was the "organic" part of the wood; that which remained was the "mineral" part, with some combined carbonic acid.

The organic part of wood is called "cellulose," and has the composition:

Carbon, . . . . .	44.44
Hydrogen, . . . . .	6.17
Oxygen, . . . . .	49.39

100.00

The ash has an average composition, as follows:

### WOOD ASHES OF SOFT WOOD.

Potash, . . . . .	3.07	Sulphuric acid, . . . . .	2.46
Soda, . . . . .	.72	Chlorine, . . . . .	.17
Lime, . . . . .	29.13	Carbonic acid, . . . . .	12.80
Magnesia, . . . . .	9.63	Sand and silica, . . . . .	26.70
Iron oxide, . . . . .	5.21	Char, . . . . .	3.26
Phosphoric acid, . . . . .	2.51	Water, . . . . .	4.34

100.00

In order to understand the part that each of the substances mentioned plays in vegetable growth, it is necessary to examine them individually. In cellulose or woody fiber we have oxygen, hydrogen, and carbon. Oxygen, the most abundant element in the universe, is a colorless gas, existing in air mixed with the gas nitrogen, and in water combined with hydrogen. The gas oxygen forms one-fifth of the air and eight-ninths of water. Combustible substances burn in this gas with a brilliant flame. From the experiments it will be seen that charcoal glows brightly, phosphorus burns with a dazzling light, and even a steel watch-spring takes fire and is rapidly consumed, throwing off scintillations. A spark on a splinter of wood will suddenly burst into flame if placed in the gas. Oxygen has recently been by great cold and pressure condensed to a colorless liquid.

Hydrogen does not exist free in any quantity in nature. Its most abundant source is water, of which it constitutes one-ninth. It can be made by passing an electric current through water, in which case hydrogen is given off at one pole of the battery and oxygen at the other. Hydrogen is however more readily made by acting on zinc or iron with a strong acid, as oil of vitriol. It is a colorless, odorless gas, and is the lightest substance in nature. When mixed with oxygen, it forms an explosive mixture. If burned with oxygen, it produces heat so intense as to be sufficient to melt the most refractory metals.

Carbon is a solid. It exists in nature in at least three forms, viz., charcoal, graphite (from which lead pencils are made), and the diamond. We know these to be different forms of the same substance, but we are not able to tell why they differ, or to change one into another.

Fatty tissue of animals contains essentially the same elements as woody fiber; but the muscle, or lean meat, contains another element called nitrogen, hence we call these "nitrogenous" tissues.

Nitrogen is a gas, constituting four-fifths of the air. If a piece of phosphorus is burned under a jar, over water, the oxygen of the air is burned out, and the nitrogen remains, and you will notice that the water rises about one-fifth the height of the jar. Nitrogen as thus obtained is a colorless, odorless gas. A candle lowered into it is extinguished, and animals die if immersed in it. The object of its presence in the air seems to be to *dilute* the oxygen. When a piece of wood burns, we are now in a position to see that the carbon of the wood unites with the oxygen of the air; this produces a substance called carbon dioxide, or more commonly carbonic acid gas. We can obtain this gas more readily for experimental purposes, by setting it free from limestone or marble by means of some acid, as oil of vitriol, or even vinegar. The gas as thus obtained is also colorless and odorless. It is so heavy that it can be poured from one jar to another, like water, and we can detect its presence by the fact that a lighted candle is instantly extinguished by it. Animals are quickly made insensible by breathing it.

Although a colorless and odorless gas, it is possible to show that carbon dioxide contains carbon. In a jar containing this gas I burn a piece of magnesium. This latter metal takes the oxygen out of the carbon dioxide, leaving the carbon, and this may be seen in the form of *charcoal*, at the bottom of the jar.

Ammonia is another substance that has an important part in plant growth. It consists of nitrogen and hydrogen, and exists in very small quantities in the air, is washed down into the soil by the rains, and is taken up mostly by the roots of plants.

These elementary substances that have been mentioned are the substances from which vegetable material is built up. When combined in different proportions, a great variety of bodies can be formed. These bodies are built up, in some unexplained way, in the cellular tissue of the plant, and chemists have in a few instances only been able to make them artificially.

As examples of these vegetable substances, besides cellulose, may be mentioned

starch (which contains 12 atoms of carbon, 20 of hydrogen, and 10 of oxygen); gum; mucilage; cane sugar (carbon 12, hydrogen 22, oxygen 11); fruit sugar; oxalic acid, and other vegetable acids; fats and oils; and gluten, a nitrogenous substance.

If we refer again to the analysis of the indestructible or mineral part of the plant, we shall notice that some of the more abundant substances are potash, lime, magnesia, phosphoric acid, sulphuric acid, chlorine, and silica. The proportion of these substances differs very much in the ash of different plants, and different parts of the same plant. For instance: the ash of wheat grains contains 31 per cent. of potash and 46 per cent. of phosphoric acid; wheat straw contains 11 per cent. of potash, 5 per cent. of phosphoric acid, and 69 per cent. of silica.

As to the functions of these inorganic elements in the growth of cellular tissue, but little is positively known. In some unexplained way they are, however, necessary to the life and growth of the plant; and as the animal maintains life by nutrition derived from the plant, these substances become a component part of the animal structure. The plant obtains these from the soil, where in the form of soluble salts they are in a condition to be taken up by the roots.

Some of these substances, as potash, lime, magnesia, phosphoric acid and sulphuric acid, are positively essential; some may be partially replaced by others, as potash by soda, or lime by magnesia; some, on the other hand, may be called accidental, for the plant will grow if the soil does not contain them. If the soil is not suited to the growth of the plant, we enrich it by furnishing *sulphates* in plaster, *nitrates*, *ammonia* and *phosphates* in guano, *phosphates* in bone phosphate, *nitrogenous* matter in dried blood, fish scrap, etc., *potash* in ashes, or German potash salts, and nearly all of these in small quantity in stable manure. The supply of material for forming the woody matter of the plant is abundant enough, only there must be the right conditions of temperature, moisture, and sunlight, to aid in the growth.

Animals, in the process of breathing, take up oxygen and exhale carbonic acid gas. Plants to a certain extent reverse this process. The leaves of plants are expanded in an atmosphere containing moisture, carbon dioxide, and traces of other substances. Under the influence of sunlight the chlorophyl, or leaf green, has the property of taking up the carbon and setting free the oxygen, by a process of assimilation. The great bulk of the plant is therefore built up by this process. On the other hand, however, in darkness as well as in sunlight, some carbon dioxide is given off from the leaf surface, oxygen being absorbed. Water may be taken up by the leaves, and furnish hydrogen, but at the same time we must remember that in the sap, which circulates through the entire plant, the mineral salts are held in solution in water.

The animal takes food into its stomach and digests it for the nutrition of the body, and by respiration the blood is purified and rendered fit to discharge its proper functions. In the plant a large proportion of the food is taken up and assimilated through the medium of the leaves, while at the same time a process akin to respiration may be said to take place.

We have seen thus the source of the organic matter and of the mineral matter of the piece of wood. With our rich, deep soil in this State, we have not learned to appreciate the value of fertilizers. We take from the soil its sulphates, nitrates, phosphates, and potash, year after year, and never pay them back. Ultimately, however, the amount of such material that is available will begin to diminish appreciably, and we shall find it necessary to return to the soil those valuable ingredients that our crops have taken away.



## HANDLING OF FRUITS.

BY G. F. ESPENLAUB.

All fruits should be picked before fully ripe, if intended for shipping. Strawberries, raspberries, blackberries, and currants, should always be picked in the cool part of the day, and, if intended to be shipped, should be picked from twenty-four to thirty-six hours before getting soft. When picking has not been done every day, two boxes should be kept by the picker, one for the over-ripe berries, and one for the firmer, as a few over-ripe berries will soon mould, often before reaching market.

As to the best boxes, the octagon quart gives the best satisfaction; it affords the best ventilation, is easily made, and is about the cheapest. Gooseberries can be shipped in bushel sacks: the coarse texture affords all the ventilation they need.

All such raspberries as are too soft to be shipped in quart boxes had better be discarded, as there are plenty of varieties firm enough to save the extra labor of the picker in sorting out the soft class.

Plums of most kinds can be shipped in third-bushel boxes. The more tender kinds should each be first wrapped in tissue paper. All should be hand-picked about three days before fully ripe, and as little of the bloom rubbed off as possible.

Peaches are best handled in third-bushel boxes. They must be picked when dry from dew or rain, and tightly packed. For near markets they can be handled in peck or gallon baskets, or wooden buckets; but handled in this way they take up a great deal of room.

Grapes are best handled in the ten or fifteen-pound baskets. They should be left hanging on the vine until nearly ripe, as they do not improve in quality after they are gathered. The baskets should be taken to the vineyard, and the bunches placed in them as fast as picked, taking care to pack tightly, and disturbing the bloom as little as possible.

Apples: The early and most tender varieties must be handled in small packages—berry crates answer a very good purpose; the later and firmer kinds in barrels. The common splint baskets, with hook attached, answer a good purpose in picking; the bottom and sides being elastic, apples are seldom bruised, and they can be lifted into the barrel and turned out without any further handling. When they are not shipped as soon as picked, I prefer to put in piles in the shade of trees; then when barreled there is one more chance to cast out defective specimens. Of the different sizes of barrels, I think the three-bushel barrel will come out winner in the end; and when once adopted throughout the country, we can ship our apples into Eastern as well as to any other markets without their taking a second place.

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[From advance sheets Report of American Horticultural Society for 1884.]

## GROWING SMALL FRUITS AS A BUSINESS FOR WOMEN.

BY M. CRAWFORD, CUYAHOGA FALLS, OHIO.

It seems to be according to the order of nature that man should face the world boldly and bravely, rather seeking than avoiding its bustle and competition, but that woman should be defended from the rough experiences of life by the stronger arm of a husband, father, brother, or son. Were she always thus happily situated there would be no necessity for planning what woman can do. Not that she should lead a useless life — no person

who is able to work has a right to be idle; but when woman keeps the home, and attends faithfully to the demands of those vocations which are suited to her, she does her fair share of the world's work. We all know, however, that even in this favored land very many women are dependent upon their own exertions for a living; and not only this, but many, besides caring for themselves, have others looking to them for support. How to provide for these is a serious question.

There are many remunerative occupations which are closed to woman by reason of her want of physical strength. She cannot well engage in agriculture. There is much heavy work connected with it which she cannot do herself, and if she attempts to hire it done the proceeds will often fail to pay the help. Market gardening is open to the same objection, and both have the added drawback of requiring too much capital.

She cannot find employment as a common laborer. Aside from the barrier of lack of strength, she could not engage in such an occupation without losing much that makes her womanly, and being reduced to the level of a beast of burden. This cannot be done in the United States without a radical revolution in public sentiment.

She cannot learn the mechanical trades, nor engage in mining, or lumbering, or rail-roading.

When she turns her attention to the lighter avocations the case is but little better; for though she may get a situation as clerk in a store, or operator in a telegraph office, or other similar position, she must be content with half pay. She may have all needed ability, perfect integrity, and a determination to render good service, but she must do for five dollars a week that for which a young man—too effeminate and genteel to work, too ignorant to enter a profession, and too poor to engage in business on his own account—will receive ten or more. We have an opinion of these ambitious young men who aspire to measuring tape, dressmaking, or any other light work that a woman could easily do.

When the professions are considered as a means of livelihood, woman is virtually shut out. A very few of her sex have studied law, and been admitted to the bar, and a few have entered the ministry. Some have studied medicine, and are doing noble work in their chosen profession. Still, the number who can engage in the law, the ministry, or the practice of medicine, is so very small that the professions seem hardly worth counting as avocations upon which women can depend.

It is conceded on all hands that women are naturally adapted to the work of teaching, and the number of those who take it up is rapidly increasing; but here again they are subject to the galling injustice of seeing men receive much higher pay for the same work. Even the principal of the high school in so large and enlightened a city as Cleveland, Ohio, asserts that men should receive better salaries than women for teaching, because they will not work for the same. They demand more, therefore they should receive more!

We hear much about the avenues that are open to women at the present day; but, look at the subject as we may, they have not an equal chance with men. Besides being shut out of many occupations by physical incapacity, and working for inferior pay in many of those in which by superior fitness and faithfulness they have gained a foothold, they find themselves elbowed by men, even in those vocations which belong especially to them, as, for instance, millinery and dressmaking.

But there is a pursuit in which very few women are as yet engaged, which offers more advantages, with fewer drawbacks, than any other to which she can turn her attention. This is the cultivation of small fruits. The leading characteristics of this work are such as to recommend it especially to women.

It is not laborious, does not require great physical strength, and yet it furnishes proper and plentiful exercise for both mind and body. There is but little heavy work connected with it, and that little can be hired. It does not require much capital. But little land

is required, and no expensive implements. When the business is begun in a small way, and gradually increased, there is scarcely any expense worth naming.

Fruit-growers meet with less competition than almost any other class, and next to none from coarse or ignorant people. Their products generally meet with a ready sale. And here, for once, woman has an equal chance with man: when she sends fruit to market no one demands it for half price because it was grown by a woman.

Fine fruit sells on its own merits; and while it has no fixed value, like wheat, a good article is always in demand at a paying price. No advertising is needed to sell it, and no money is spent in building up a trade. It can be grown in any part of the country, and there is a market for it wherever people live. The demand for fruit is not based simply upon its being delicious and attractive—it is a real need. The human system has a natural appetite for the combination of acids and sugar that is found in berries.

When we think of the thousands and millions of people who live in cities and raise nothing, we partially realize the extent of the demand for fruits, and the conclusion is that for a long time to come the demand will exceed the supply. True, the market is sometimes overstocked for a day or two, but in such a case the producer can dry or can the surplus. The market for dried fruit is never overstocked.

Small-fruit growers have another advantage in the fact that their products come into market in the summer, when people have money and are liberal in spending it, rather than in the winter, when many are idle, and when those who have employment find that the necessities of life make such heavy demands upon their earnings that they have little left for luxuries.

The advantage of being one's own employer is worth much. No one can fully appreciate this until he has been subject to the call of a bell or a whistle. There is not a single qualification needed for the business of growing small fruits that woman does not possess. Indeed, a much larger proportion of women than of men are suited to the work. Farmers in general will let their families go without fruit rather than to raise it, but farmers' wives are interested in horticulture. They raise the flowers, and often the vegetables. They attend to details. They are in sympathy with their pets, and learn their habits much sooner than men do. As a rule, they are not so apt to neglect their work as men are. Added to this, they have a "knack" which gives them success. A skillful gardener once said that a woman with a cracked teapot could root cuttings that an experienced propagator with all his modern appliances would fail with. It is not hard work, nor the ability to do hard work, that makes fruit-growing successful: it is the heart-work, the real interest, the carefulness and faithfulness and good judgment that are put into the enterprise.

Lack of knowledge is no obstacle, for this can be acquired easily and quickly. There are no secrets in fruit-growing. Those engaged in it are always ready to communicate their knowledge, and every horticultural society is engaged in disseminating information.

#### HINTS TO BEGINNERS.

First, post up on the work. Study your facilities, your land, capital, nearness to market, and ability to obtain needed help.

Secure the control of some good land. It costs as much to prepare and cultivate poor land as rich, and the profits are little or nothing.

Begin in a small way. You will make some mistakes, and will have much to learn. If you do everything well, and at the right time, you cannot attend to much at first.

Plant but few varieties, and only such as generally succeed. You can well afford to do without those new kinds that are "destined to supersede all others."

Be more practical than theoretical.

Be more ready to believe what you see than what you hear.

Take some good horticultural papers, and read them attentively.

Join a horticultural society if there is one within your reach.

Do your work well. Both profit and satisfaction come from a little well done, rather than a large plantation grown in a slipshod manner.

Sell no poor berries. They will injure your credit more than they are worth. Use them, or give them to those who have none and cannot afford to buy.

Keep your plants growing during the growing season. Injure no roots in cultivating. Plants make their own repairs, but they should be better employed. The force expended in healing a broken root might be more profitably used in building up the plant or storing away nourishment for the next crop of fruit.

All the berry plants do best on land that is rich, moist (not wet), and cool. Without richness, there is nothing to make fruit of. Without moisture to dissolve the food in the soil, it is unavailable, for all plant food is taken up in solution. Without a comparatively cool soil, the plants cannot remain healthy. Each plant should have plenty of room, and no other roots should be allowed to rob it of food and moisture. The surface of the soil must be kept loose by stirring or mulching, so as to admit air to the roots, for they cannot live without it. As a plant can make its wants known only by signs, he who best understands these signs, and is most faithful in supplying the wants expressed by them, will succeed best.

The fruit-grower is an employer, and each plant set out is an employé which can accomplish much or little, according to the master's knowledge of its needs, and his faithfulness in providing for them. Each plant set out is an independent establishment, and if not hindered will go steadily on doing the work appointed to it by nature—gathering its food and changing the raw material, by means of rain and sunshine and the atmosphere, into delicious fruit. It is a pleasant thought that the plants which we set out and care for are so many little helpers engaged in our service; and whether we sleep or wake, are sick or well, they still go on with their silent, busy work.

It is the fruit-grower's province to see that all the conditions are favorable, so that there may be no interruption of this work. His returns will be in exact proportion to his judgment and thoroughness in this respect. This is a point where knowledge is power.

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## SMALL FRUITS.

BY THE SECRETARY.

(In compliance with request of the Society at its Thirteenth Semi-Annual Meeting. See p. 5.)

This paper will treat of the different classes in the order of their ripening period.

### THE STRAWBERRY.

The first thing to consider in connection with small-fruit culture is

#### LOCATION.

The strawberry succeeds in more different locations than any other of the small fruits—on high and low lands, on deep black loam, sandy and clay lands. In fact some variety is peculiarly adapted and succeeds best on some one of those locations and soils. For instance, the Wilson's Albany forms a larger stool or plant on an adhesive black loam; is most productive; the berry large through the season, and of a firmer character, which renders it a much safer fruit for shipping to distant markets; while the Sharpless, Capt. Jack, and Cumberland Triumph do best on a sandy clay, and what is often termed mu-

latto soil. All locations should be selected with a view to best conditions for growth of plant and berry; and one of the most important is to secure such as will not suffer from a drouth, especially during the fruiting season, and yet have sufficient surface or sub-drainage to prevent saturation from rainfalls. The main objection to low land is its liability to late spring frost, which injures the early bloom.

#### PREPARATION OF THE LAND.

I have never yet seen land too thoroughly prepared, or too rich, for a strawberry plantation, and in general field culture there is no danger of its being made so. The deepest plowing (even subsoiling), harrowing, and manuring with well-rotted material at the rate of fifty wagon-loads to the acre, will furnish the best results in both plant and fruit. The planter should bear in mind that a strong, well-grown plant generally develops a greater number of fruit buds (called crowns), and that the vigor of these buds, and the size of the fruit, depend upon the strength of the plant; that a vigorous and well-developed plant maintains a large size of fruit through the season. Again, that according to the number of the crowns developed on each plant, so is the extent of the yield.

One-year-old plants should always be selected — never any older, unless the first cannot be obtained. There is no profit in using any other age. The maximum vigor of a strawberry plant is attained at one year old, and, having borne a crop, begins to weaken from that time on. It is true, that by removing the fruit buds, the vigor can be maintained for two years, and then yield a full crop; but the first crop will be the finest one of its existence, provided there are no unusual adverse climatic conditions.

For field culture the plants should be set in spring, in rows four feet apart and one foot in the row. This distance affords every facility for easy horse-power culture, and ample passage-ways for pickers passing to and fro. The finest berries and heaviest yield are produced where all runners are kept cut off, and the plant confined to stool form.

Constant and thorough tillage of the land between rows should be given from early spring to late fall, during the first year; then mulch during the winter with old prairie hay, varying in thickness from two to four inches. It is not necessary to be particular as to the thickness for fear of smothering the plants, if it is loosened up or partly removed before the plants begin to grow in early spring. The object of this mulching is to prevent the ground from heaving by frost, and to protect the plant from sudden changes in weather. The strawberry plant will survive most any degree of frost if not too sudden, or after frozen, if not too quickly passed to a thawed condition. Mulching should be moved off in spring sufficiently to permit the leaves and fruit stalks to shoot up through, and to form a clean bed on which the growing fruit can rest out of the dirt.

As above stated, the first crop of fruit is usually the finest, and hence most profitable. The next year's is seldom as good, and while it may pay to continue a plantation through a second year, *it does not through a third*. For a profitable business, new plantations should be made each year to take the place of the older ones, and thus keep up a successive profitable work.

**LIST OF VARIETIES.**—The following succeed best on black loam: Crescent (pistillate), Wilson's Albany, Miner's Great Prolific, Green Prolific, Glendale. On red clay (mulatto soil) and sandy land: Chas. Downing, Capt. Jack, Cumberland Triumph, Sharpless, Kentucky. The above are arranged in the order of profit and season of ripening.

The Crescent is the earliest profitable variety succeeding in Kansas, and being pistillate, requires in a plantation a row of some staminate variety near it. The Wilson's Albany, being strongly staminate, is a good variety for such purposes. I will not speak of the many newer varieties recently introduced, as so far they have not been sufficiently tested to give them a general recommendation. The results are only local as yet.

## RASPBERRIES.

## BLACKCAP VARIETIES.

The most suitable locations for these kinds are uplands having a black loam soil with a subsoil of clay, and sloping in an easterly or northern direction. On such locations the canes make the strongest and healthiest growth; the berry is large and of the best flavor. Another point in favor of such locations is, that they are not so liable to the injurious effects of summer drouths.

The preparation of land should be very much as stated for the strawberry, with the exception of enriching with stable manure. This is not required until the plants are ready to fruit, and then it should be thrown on the surface of the land around the plants in the fall or during the winter, and worked in during cultivation the following spring. They should be set out during *early* spring, in rows at least six feet apart and four feet in the row; cultivate thoroughly until the first of September. If the land is kept in a loose, mellow condition, there is but little danger of injury from the intense heat of our summers.

At the opening of the next spring, cut all growth back to within a few inches of the ground, and cultivate same as in previous year. When the canes have attained to fifteen to eighteen inches in height, cut off the terminal to induce a lateral growth. The following spring, cut back the lateral growth of the preceding year to one foot of the main stem, and from them will be produced the crop of fruit. It is important to keep up cultivation even through the ripening period of the fruit, as the tramping by pickers of the space between rows will often pack the ground quite hard, which injures the crop, both in size of berry, and in shortening the season.

LIST OF VARIETIES.—The following are named in the order of ripening and profit: Souhegan, Smith, Hopkins, McCormick, Gregg. These are all hardy varieties, and very productive. The Souhegan is one of the recently-introduced varieties, the earliest in ripening of any, and is giving satisfaction wherever tried. The Gregg is the largest berry; late, and best suited for shipping to distant markets.

## RED VARIETIES.

These generally succeed best on a red clay sandy land, or on shaly upland. The finest quality and yield are produced on eastern slopes on side-hills, and there the plant makes the healthiest growth. On black loam and lowlands the strongest plants and largest berries are grown, but the plants are more liable to climatic injuries, and the berries lack the fine aromatic flavor which is sought in a raspberry, and is peculiar to the red varieties—and especially those belonging to the Antwerp family.

Canes of the red varieties should not be permitted to form in broad massed rows, as they are wont to do if allowed to follow their nature, but confined to a space not more than a foot wide, and kept cultivated same as given the blackcap varieties; nor should the canes be cut back until early the following spring. If cut back during the growing season, they form laterals which are puny, and are most generally killed the following winter. As these sorts do not form bow canes, like the blackcap varieties, the rows may be closer—say four feet—without interfering with cultivation.

## LIST OF RED VARIETIES.

There are very few of this class which succeed in Kansas. The Turner, Brandywine and Cuthbert are the most profitable, but can hardly be called so when compared with the blackcap varieties. The Turner possesses the finest flavor, and the Cuthbert is the best for shipping purposes. Shaffer's Colossal, a new variety, promises to be the most reliable of any yet introduced. The plant is quite hardy under our winters and the heat of summer; makes a strong, healthy growth. The berry is very large, but lacks good quality. Its color is complained of as unfitting it for a market berry. With this I can-

not concur. It can be picked when of a bright red, as the Turner, and is then in a good condition for shipping, or can be allowed to remain on the plant until fully ripe, when it becomes a dark purple, and is in its best condition for table use. In these features we have advantages which no other berry affords. Its extremely large size at either of the stages named will command attention, and a ready sale at better prices than the others named.

#### CURRENTS.

This class has not been successful either in fruiting or in profit, nor is it advisable to attempt to grow it, excepting for family use. It *could* be made successful with every planter, but the means required do not justify extensive planting. If planted on the east side of a board fence or stone wall, or on the north, or in any location where the intense heat of midday is broken from it, on moist land, well enriched and mulched, it will fruit abundantly, and afford a larger berry than is usually found in the Eastern States.

LIST OF VARIETIES.—These are given in the order preferred: Large Red Dutch, White Dutch, White Grape, La Versailles, Cherry, Black Naples. The first three in this list have been the most satisfactory, both in plant and fruit.

#### BLACKBERRIES.

This class will thrive on general soils, but is most profitable on moist, black loam, and in locations having a northern or eastern slope; and the richer the soil, the better the results. Land should be deeply and thoroughly prepared; and where well-rotted manure can be obtained, 50 to 100 wagon-loads to an acre, broadcasted on the land before plowing will add greatly to the strength of plant and size of berry. The plants (one-year-old suckers) should be set in rows eight feet apart and four feet in the row, well cultivated through the spring and summer; but give the plants the fall months to ripen their wood before winter overtakes them. The following spring, cut back the growth to near the ground, and cultivate as above recommended. When the canes have reached eighteen inches in height, cut off the terminal to induce lateral growth, and the following spring cut back the laterals to within one foot of the canes. From this on it is best each year to keep the rows well mulched, and spaces between cultivated. All suckers should be kept down, and the rows kept in stool form. Each year continue the cutting-back system, and manure and mulch heavily.

LIST OF VARIETIES.—The following are recommended in the order of success and ripening season: Early Harvest, Kittatinny, Snyder. The first is the earliest variety yet introduced. Berry small, medium quality, and plant productive. The second, where not troubled with rust, is the finest in the list. Berry large, of fine quality, and plant productive. The last is hardy in plant, strong grower, and productive. Berry medium size; very poor quality.

Of the newly-introduced varieties, the Taylor is promising in localities where planted; exempt from rust, and apparently well adapted to our climate.

The culture of small fruits, whether in field or garden, is one of the most pleasant and interesting pursuits in which a tiller of the land can engage. The work is light and varied, and the success, under intelligently applied means, is more remunerative for capital invested than any of the crops grown in general farming. It involves thought, study, and care, and leads to close observation and system—traits in which so many are lacking, and which are important to success in any line of business. It affords one of the best opportunities for the training of children, offering many and great inducements for the development of industrious habits, healthy exercise, and finer sentiments; and parents should consider well these opportunities for advancing their children's present and future well-being, before they allow themselves to become indifferent towards so important a matter.

## METEOROLOGY.

BY PROF. JOHN H. WOLFE, WELLINGTON.

To obtain more positive knowledge of the prominent facts relating to climate in favorable as well as unfavorable seasons, it becomes evident that a daily record, continued for a series of years, affords the best means of securing data upon which to base a correct solution of the various problems as to climatic effects and their relation to horticulture. However, with the aid of a uniform method of observation, we will introduce the subject of recorded rainfall measurements, embraced within the periods of each year, from March 1st to September 30th, which is generally called the "growing season." Our record at this station began in 1879, and has been continued without interruption to the present time. From it we have prepared tables and notes, showing the comparative frequency and quantities of precipitation, expressed in inches and hundredths; also the number of days for each season when .01 inch or more of rain has fallen, as follows:

TABLE I.

<i>Year, 2½ days.</i>	<i>March, 31 days.</i>	<i>April, 30 days.</i>	<i>May, 31 days.</i>	<i>June, 30 days.</i>	<i>July, 31 days.</i>	<i>August, 31 days.</i>	<i>Sept., 30 days.</i>	<i>Total rainfall.</i>	<i>No. of days.</i>
1879.....	0.00	4.50	1.16	6.35	2.52	3.88	2.50	20.91	36
1880.....	1.45	.54	3.91	3.65	3.68	1.84	1.34	16.41	40
1881.....	2.73	1.14	9.37	3.20	3.21	1.60	11.19	32.44	56
1882.....	.96	3.10	7.20	3.62	5.28	1.10	3.87	25.13	51
1883.....	1.14	2.06	6.53	5.34	6.64	5.51	4.65	29.87	50
1884.....	1.05	3.67	4.79	4.21	1.89	3.44	1.10	20.15	65

The winter preceding the summer of 1879 was generally noted for the soil being very dry, with scarcely any snowfall, and the mean temperature of the air about the average. The spring months were generally characterized by their numerous violent dust-storms, and, as appears in the above table, March passed without any rain.

The work of tree-planting in the early part of this season was followed by numerous disastrous results. However, the comparative view of temperature was favorable for an early season, as peach trees were seen in bloom on March 29th; the last trace of frost on April 18th. But various facts as to the general cultivation preparatory to tree-planting, as observed in this year 1879, and a comparison with the manner of cultivation during six years later, lead us to think that the drouth was not the principal cause of failure. In many cases the land was not plowed—only holes dug on the open raw prairie, and four to six-year-old trees planted, under the statement, as an inducement, that these would fruit the first year. To the experienced planter, such practice shows that the cause of failure was not alone attributable to the prevailing drouth, as in some few instances orchard trees which were planted and given deep cultivation stood the severe trial of the season and made a thrifty growth.

We observe the number of heavy rains exceeding one inch at any one shower during the seven months above named, as follows: For 1879, 10; 1880, 6; 1881, 10; 1882, 9; 1883, 14; 1884, 4. Now direct your attention to the fact of the annual increase as to the number of days on which rain has fallen. By examination of the last column of the table it will be found that, during the growing months of 1879, a rainfall occurred on thirty-six days, while the number of heavy rains, exceeding one inch, is two above the average of the five following years. Also, compare it with that of 1884, which contained sixty-five days on which rain fell, this being double the number occurring in the former year.



As our record only extends back over six years, it covers too short a period from which to form a definite conclusion in regard to the annual increase of rainfall on the western prairies of Kansas. We find, however, by a close observation as to the growth of vegetation, and of tree growth generally within the past six years, that a remarkable increase, apparently wonderful in a great many localities, has taken place. This fact may confirm another opinion, yet hardly furnishes conclusive evidence, viz.: that the moisture retained in the loosely-cultivated soils, by the aid of an exuberant foliage extending over the greater portion of the surface, will frequently sustain a living growth in vegetation throughout a dry period of thirty days; while the same temperature and comparative circumstances of the same length of time six years ago would have proven more disastrous.

In forming a conclusion in regard to temperature, our brief record is rather too limited to afford an absolute certainty, yet bears us out in the opinion that the moisture (or in other words, the proper facilities for retaining it) on the surface is increasing; and the annual mean temperatures are decreasing.

We herewith submit table No. 2, showing the mean temperature for each year, for the period including March to September; the record being taken from a standard thermometer furnished by the U. S. Signal Office. This instrument has been used throughout the entire period named, and during the two years 1879 and 1880 its position was upon the open prairie, while during the four following years upon a portion of the surface in the vicinity an extensive tree growth was cultivated. In this possibly a slight influence may have intervened to deflect or retard the absorption of heat, and prevent to some extent the escape of moisture by evaporation.

TABLE II.

<i>Year, (March to September, inclusive.)</i>	<i>Mean.</i>	<i>Year, (March to September, inclusive.)</i>	<i>Mean.</i>
1879.....	67.63°	1882.....	63.82°
1880.....	67.18	1883.....	63.32
1881.....	68.02	1884.....	63.85
Mean for first three years.....	67.61°	Mean for last three years.....	63.66°

The average mean for the first three years in the above table shows it to have been 3.95° higher than the mean for the last three years. By referring to table No. 1, it will be seen that by dividing the period of six years' rainfall, the total for 1879-1881 is 68.76 inches; total for 1882-1884, 75.15 inches—an increase in the last three years over the first three of 6.39 inches.

As the record of weather observations is continued in the future, we may give more definite ideas in regard to the decrease of temperature and an increased moisture with modified and more numerous showers of rainfall.

## GRAPE ROT.

BY F. HAWN, LEAVENWORTH.

In my last report reference was made to means of preventing grape rot. Further experiments, but more thorough, proved a failure, for my crop was totally destroyed by the disease. Nor will any local application come within the range of practical utility, for the exciting cause of the destructive agent is so closely connected with atmospheric conditions, and over which we have no known control, but may be modified as hereinafter stated

The destructive agent is undoubtedly a fungus parasite. Its depredations are not confined to the grape. Apples in the near vicinity of the vineyard carried on their surface the plague-spots so often observed on the grape. During the earlier stages of the growth of the apple, half of a crop of Ortleys were destroyed by blight, and other varieties badly damaged—mostly on the lower portions of the trees—whether from the growth of the plague-spots referred to, or some other fungoid species, was not determined.

The rot of Concords prevailed to a great extent in the vicinity of Leavenworth, yet there were some good crops in localities not far distant from where failures prevailed, without any apparent difference in the soil, and at least one clean crop where rot should have prevailed, according to the old theory of the causes of that disease. It is known that, in some of the grape-growing districts in Europe, subtle elements escaping all analysis change the quality of the same variety of fruit when grown in different districts. A case in point is the famous Madeira grape, which sustains its good qualities only in a limited area, outside of which it invariably fails to come up to the standard of excellence of the home production. In the valley of the Rhine, in one of the bends the vine may flourish, while perhaps in the next bend, not far distant, it fails. The history of the vine in Europe is full of such contraries.

In estimating different results in different localities in close proximity, but differing in topographical features, we too often omit to take into consideration the coincident angle of the solar rays with the surface at each locality; or, in more practical terms, the probable difference in the temperature of the soil by the greater facilities of the one over the other to absorb the sun's rays.

Omitting critical accuracy in the remark that the force of the solar rays in this latitude is as the meridian angle to the plane of the earth, hence on the first of January the sun, in his extreme southern declination sends his rays to us in so slanting an angle that but a limited amount of heat is absorbed by the earth, and we then have our coldest weather, though the earth is 3,000,000 miles nearer the sun than on the first of July, when the solar angle and the thermal conditions are reversed, and the sun, in his more vertical position, shines down upon us more direct, and then we have our hottest weather. While those primordial periods refer to aggregates, they readily suggest that in their local application the results will be approximately diversified by inequalities and altitudes in earth's surface, and nominally in different districts in circumscribed areas, and locally depending on the position towards the sun. This becomes more obvious when we reflect that most of the heat of the air is radiated from the earth's surface, having first been absorbed from the rays of the sun. It will readily be seen by the following, how radically the local temperatures of the soil may be diversified in limited areas for limited periods by a diversified topography: "When the maximum temperature of the air reaches 70° or 80°, the soil may reach 110° to 130°." But this extreme temperature is as readily thrown off after the sun's rays cease to heat the ground. "Even before sunset the surface rapidly cools down, and it will be found, after a clear night, it has not only lost its preponderant heat of the previous day, but it is from 4° to 8° colder at sunrise than the air four feet above the ground." But soon the heating process of the air, as on the previous day, is renewed in a clear day, and within the scope of ten progressive hours or less, the maximum temperature of 130° of the soil is regained, passing through a thermal range of 138°. Illustrative of the principles involved in the interchange of the temperature of the earth's surface and the air is noted thus: while the thermometer marked 5° below zero, and the mercury had clustered around the zero point for three days previous, thawing was observed on the face of a bank well exposed to the two-o'clock sun. Here, then, we see that the solar rays, after passing through the air with a temperature of 5° below zero, their latent power was sufficient to produce thawing on the face of the bank; nor would the result have been materially varied had the sun's rays passed through a transparent sheet of ice before reaching the bank. In the radical

changes between the day and the night, the low grounds are affected most, for the process of radiation of the heat from the soil produces a low temperature, and these receive the cold and heavier air from the higher surfaces — particularly the valleys nearly surrounded by high hills. Such valleys become rapidly heated when the sun shines, and, not being so much influenced by the action of the winds, retain more of their heat until later in the day, and when radiation begins elsewhere, are suddenly deluged by the cold air displacing the warm, which ascends to higher levels. This interchange of air of the night — that is, the colder or heavier sinking, and the warmer or lighter rising — continues until (at least in theory) an equilibrium is established in regular graduation with the colder at the bottom of the valleys, and on up to the warmest on the highest ground.\* The summer-morning fogs of the valleys are ocular illustrations of this distribution of heat. The colder air in their lower portions condenses the moisture of the air into fog, while the humidity in the warmer atmosphere above remains attenuated and invisible.

It is then seen that in these diurnal climatic cycles the temperature of the soil in some places is frequently subjected to a range of near 140° in the twenty-four hours,† which seems not very congenial to exotic trees and plants from colder climates or native species of umbrageous origin, such as our cultivated grape-vines. In their primitive state they are protected by genial shade from the fierce rays of a midsummer sun and the arctic blasts of winter, and a natural mulch protects their roots from an overheated soil in the summer and the frosts of winter, with a diurnal range of temperature in the growing seasons of 50 per cent. below that of the open grounds. In their cultivation, true to our European predilections, we select the greatest possible extremes from their surroundings in their native homes by transplanting them to southern exposures, where they receive the greatest possible force of the sun in the summer and nearly daily alternations of freezing and thawing in the winter — give them bare culture which raises the temperature of the soil to the highest possible degree — by deep plowing mangle their roots at a season when their sap nearly flows in the furrow, and, moreover, mutilate their branches beyond recognition, transplants and treatment the hardiest trees of the forest fail to withstand.‡ In extenuation of these barbarities we refer to European success with similar culture, omitting the consideration that the same varieties of grapes there have been grown time out of mind with undeviating methods, consequently the constitutions of their vines have assimilated to their system. Individual varieties have been cultivated in particular districts so long that the vine has acquired modified functional activities in accordance with its surroundings, and when moved from this locality and cultivated elsewhere it becomes a sub-variety — probably a retrogression toward the original or former type through more restricted regressive influences.§

What then can be expected of our own native grapes with their primordial constitutions nearly intact? Under proper treatment, much. But the haphazard, and in many cases incongruous management, is bringing disappointment. A development in the successful treatment will be tardy when not directed by science or discriminating thought. By consulting the principles affecting local temperatures applied to localities with the least diurnal variation|| in temperatures and other proximate conditions of the vine in its native state, we may succeed.

\* This does not include uplands away from broad valleys. Yet all undulating surfaces are subjected to the same law, with results proportionate to the difference in individual levels.

† This suggests the propriety of mulching.

‡ It is well known (at least to those who have made the trial) that trees transplanted from forests to open ground languish, never grow into flourishing trees, and more often die the second year.

§ We here observe the delicate functional susceptibility of this plant, which forecasts the difficulties we are to encounter in perfecting our own.

|| Kelley's Island, in Lake Erie, where successful grape-growing has become proverbial, is surrounded by a body of water with a temperature during the growing season that precludes any radical changes, particularly between the day and the night.

It will not do to say, "I have raised good crops of grapes under conditions you condemn." Some years ago the Catawba, Delaware and Concord produced good crops in most any situation. Some of them do so now while the vine is young and in favorable situations, but no intelligent horticulturist will pronounce them reliable under all circumstances. And thus it will probably be with all the varieties of the fox species until a proper system of treatment is established.

In Leavenworth, on the premises of Mr. John Burr, that veteran horticulturist, are vines of some twenty different varieties of the fox species, including the Concord and Delaware, in the best condition, planted promiscuously, trained over arbors, shaded and protected by buildings or trees on every side, proximating as closely to their original condition as artificial means could provide. These vines bear abundant crops, free from rot and other diseases, though some of the varieties are among those known for their persistency in rotting in other locations.

The views referable to the native grapes are also applicable to all umbrageous native fruits, and to a limited degree to fruits of northern origin, particularly the apple, as also our staple plants of the field and the garden. We have many unpublished notes, collected under official duty, bearing on this subject; but as they relate principally to agriculture, they would be irrelevant here.

In the matter of soil I have no suggestions, except that I may say that when a youth I had with my comrades many a feast on the luscious fox grape and juicy blackberry in the wilds of Delaware river valley. These grew spontaneously on a soil so barren that it was utilized only in small patches for the cultivation of the most ordinary agricultural productions. Nor was the refuse of the scanty forests suffered to moulder into soil, for every few years the fires swept over the surface, consumed everything, leaving only the ashes behind. Over those burned districts the blackberry renewed its vigor and fruitfulness, surpassing anything seen in plantations where deep plowing and stimulating manures were utilized.

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## TRANSPORTED SOILS.

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BY L. A. SIMMONS, WELLINGTON.

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In the paper which I read before this Society at the semi-annual meeting, an inquiry as to the formation of soils, I undertook to demonstrate the fact that while sand, clay, and lime in some of its combinations, were the main or principal ingredients of all productive soils, these elements have resulted from the disintegration and decomposition of the rocks of the same or some not very distant locality.

The positions then taken and the conclusions reached, I now contend are true and irrefutable so far as they relate to what are termed *sedentary* soils, that is, those which were formed in the position or locality where we now find them; but a large portion of the soils of our State (or the rocks from which they mainly originated), instead of belonging to the *sedentary* class, really belong to the class termed *transported*. In other words, the soils themselves, or the ingredients from which they are formed, have been brought to their present position in the unnumbered cycles of the past, by certain natural agencies, of which water was the chief and most potential.

I now propose to take up the subject of transported soils, and will notice, first, the original location; secondly, the means of transportation; thirdly, some of the effects or consequences of transportation; and finally, the changes which have since taken place.

Transported soils, and the materials of which they are composed or formed, are in

scientific works commonly divided into two distinct classes, which are termed Diluvium and Alluvium. Diluvium, otherwise known as drift, is a deposit of bowlders, gravel, sand, and clay, which is spread with a considerable degree of uniformity over the polar regions and the adjacent portions of the temperate zones. In our geologies, it is said to be of recent origin, as it overlies the strata of the Tertiary or Pliocene age. On the Western Continent, it is in the polar regions characterized by bowlders, many of which are of immense size; but as we proceed southward we find a constant decrease in magnitude, until at about latitude 38° they entirely disappear. To speak more definitely, and from my own observation in a portion of our national territory, I will state, that in Minnesota I have seen bowlders fifteen feet or more in diameter; in northern Iowa, from four to six feet in diameter, while on the southern border of the same State they are seldom found larger than a common-sized washtub; in the northern part of Kansas they are still smaller, and south of the Kansas and Smoky Hill rivers entirely disappear. Yet far to the southward, and beyond the boundary of this State, are found vast quantities of gravel and sand, which evidently had the same original status as the bowlders of the frigid north, being composed of the same ingredients, and containing proofs of actual kinship.

This diluvial deposit or transported portion of the earth's crust is by the geologists subdivided into stratified and unstratified drift. The unstratified drift consists of a heterogenous mass of rocks, gravel, sand and clay; while the stratified is plainly a re-arrangement by water of the same material, when to a greater or less extent disintegrated and decomposed.

Now without stopping to discuss the iceberg theory of Dobson, or the icecap-glacier theory of the elder Agassiz, as to the means of transportation, I state the fact as being well established, that the materials of this deposit were certainly transported from the polar regions to the southward, and that water and ice were the means of transportation. As the smaller rocks and lighter materials were more readily moved by the action of the waves and currents, they were swept further to the southward in the grand original movement, than the massive bowlders. Then, as the solid surface of the earlier strata, upon and over which this stupendous mass from the polar regions was impelled, was torn into deep fissures and chasms by volcanic action, or worn full of deep gulches and ravines by the emptying out of seas and perhaps oceans, the necessary result was that such chasms and gulches were to a considerable extent filled up, and the general surface of the continent rendered much more nearly level.

Of course a drift would leave all the materials with which it parted in its course scattered promiscuously, and so it might at one place deposit rocks, or gravel, or sand, or clay, or a heterogeneous mass of all. But this period of drift we find was followed by a long period of submergence; that the diluvial deposit, instead of remaining upon the surface exposed to sunlight and the winds, by some of those stupendous changes which took place in the preparation of the earth as a habitation for man, became the bottom and in turn the shores of vast bodies of water; and here the constant action of tides, currents and waves swept the diversified mass hither and thither, grinding off the corners of the bowlders, polishing the pebbles against each other, and with the ever-increasing quantity of sand; while the portions completely pulverized by abrasion or decomposed by chemical agencies must have rendered the seas or lakes muddy during periods of commotion, or in a calmer era sunk to the bottom as sediment, forming those vast beds of clay or marl which are so common the whole country over, in all of which some portion of silicious matter still holds place. By this process the drift became stratified, in some localities to change in the succeeding ages into the recent sandstones, in others to remain clay forever.

Again, portions of the drift which had become wholly or in part stratified were probably for many centuries exposed to the action of the sun, the winds, and the rains, which set in motion those wonderful chemical agencies upon which I have dwelt in a former paper. Then followed other periods of submergence, succeeded by those of exposure to

light and atmospheric action, until the whole mass assumed the form and consistency in which it is now found, being transformed from rocks to gravel, sand, and finally the clay which covers the bed-rock or stratified masses of the earlier geological ages; and thus to diluvium I trace the origin of the subsoils of all our higher lands.

The other class of transported soils, known as Alluvium, consists of gravel, sand, marl, humus, etc., which has been carried oceanward by the running streams of the present geological period.

The portion of humus or surface soil which by the rains is dislodged and carried down the hills and even the gentle slopes, the masses of rocks, gravel and clay swept down by mountain torrents, together with the diversified substances worn by all running streams from their banks and beds, (the brooklet, the creek, the river, successively carrying on the work,) all are swept downward, mingled together and combined to make up the deposit known as alluvium.

The washings from all slopes and hill-sides, which for ages before this country was inhabited even by the aborigines, and which still continues, has formed in all our valleys a deep, friable, porous soil; and although portions of this are being continually carried further and still further downward by the streams, especially in rainy seasons, when freshets do their destructive work, I wish all to understand that this accumulation in the smallest valleys is as truly alluvial as the vast deposits at the mouths of the great rivers of the world.

That this process has been going on for untold ages, is proven by the fact that we find that this identical material has in some places been cemented into solid rock, and in others has received and retained accretions of iron, until it is quarried as iron ore. The vast deposits of Alluvium collect slowly and silently, yet in the course of ages form vast tracts of land. At the mouths of all great rivers the alluvial deposit or delta is constantly advancing, as the gulf or bay into which the rivers empty is gradually filled. The annual deposit at the mouths of the Mississippi is computed to be sufficient to cover 144 square miles one foot in depth, and in this way the whole State of Louisiana has been formed in what was once the Gulf of Mexico. Yet this enormous deposit is small as compared with that at the mouth of the Ganges and Bramapootra, where the deposit is found to be over 500 feet in depth, and the area covered is larger than the States of Kansas and Nebraska.

The action of tidal currents and waves upon the shores of the oceans wears down the rocks and forms the same kind of a deposit, and a like effect is perceivable upon the shores of all seas and lakes; so that it may be safely asserted that wherever water in motion comes in contact with the land of the earth's crust, be it seashore, beach, strand, or the bank of a stream, the consequence is that some portion is worn away, which as sediment is distributed and relocated. This is true, even though such original shore or bank is composed of the hardest rocks. As against the bare force of water, as in waves or running streams, it is true the marble or granite ledge might stand almost unchanged for unnumbered centuries, were it not for the auxiliary forces which are brought into play. In connection with water, the action of both heat and cold, of freezing and thawing in the polar and temperate regions, and that mighty, yet generally silent element and power known as chemical action, are invoked; and when centuries have elapsed, lo! the solid rock has yielded and been worn away—even, as it is said, the constant kissing of devotees has removed the great toe from the statue of St. Peter, in the grand cathedral at Rome.

Besides this, the sand and gravel, swept by the waters upon and against the rocky shores, gradually polish and crease the most adamantine surfaces, and in so doing remove a part of their actual substance.

The alluvial deposits are geologically characterized by containing the fossil remains of man and the animals which now exist upon the earth; but when we consider the ma-

terials of which the vast ledges of stratified rocks, probably a mile or more in thickness the whole earth over, are composed; and reflect that at some period in the unnumbered cycles of the past all this was held in solution by water, as the Missouri river (familiarily known as the "Big Muddy") now holds in a sedimentary state a comparatively insignificant portion of clay and marl, we realize that the formation and transformation of alluvium have been going on ever since the earlier part of the day, if not from the very dawn, of creation. Can this be doubted, when we know that all stratifications are but sedimentary deposits, placed in position and arranged by water?

We find, then, that diluvium has furnished a very large portion of all the ingredients of which our soils are composed; that it was transported from the polar regions, and distributed over a considerable part of the temperate zones in the glacial period; that at successive periods it formed the bottom and then the shores of seas and lakes, where, by the action of the waves, the rocks lost their angularity, the pebbles were rounded and polished, producing vast quantities of sand and clay, which were shifted from place to place, drifted by currents or carried as it was held in solution; then that periods of submergence were interspersed with periods when the materials were exposed to the heat and cold of successive seasons and the dews and rains of Heaven—so that a constant disintegration of the rocks ensued, and the tremendous enginery of chemical action on all parts and particles was brought into full play, until the clays and marls which form our subsoils were placed in the position where we now find them, and being composed of the same ingredients as the rocks of the several successive geological periods, must be rich in the silicates, phosphates, carbonates, etc., which I have heretofore shown are indispensable elements for wood growth.

We find further, that by the incessant washing-down from all hillsides, the valleys have received an alluvial deposit, rich in all the elements of telluric plant food—the very cream of the soil, because it has been the more exposed to the chemical agencies set in motion by heat, frost, rain, etc.; that this deposit has for countless ages been swept down by all the streams, especially in rainy seasons, and by great freshets, until whole States are formed at the mouths of the great rivers, of which the soil is wholly alluvial. And here in passing, I call attention to the fact that what we now call valleys or bottoms, were probably in the earlier portion of the Post-Pliocene period, merely the beds of the streams—the flowing currents then being so wide as to extend from bluff to bluff, and these during numberless centuries have diminished in volume and shrunk down to the narrow beds they now occupy, leaving vast areas covered deeply with the richest and most productive soil which man has ever attempted to cultivate and improve. All the great corn-producing districts of the world have an alluvial soil. Yet as we have seen, all or nearly which we now call alluvial must at some period in the wonderful past have been truly diluvial.

It is strongly contended by many horticulturists, that the largest, fairest and finest fruits are raised on the rich bottom lands, the purely alluvial soil; and perhaps by as many others, that the best, the more finely grained and most delicious, are produced on the clayey lands of the hills and hillsides—in brief, on a soil of diluvial origin and construction. My own observation leads me to favor the opinion that the largest and fairest apples and peaches owe their size and beauty largely to the richness of the alluvial soil where they were produced; and that while the same varieties borne by a clayey hill or hillside orchard might be inferior in point of size, they far surpass those grown in the valleys in firmness of flesh and in delicate and delicious flavor. If this impression (it is not yet a confirmed opinion) is correct, it would follow that rich alluvial bottom lands should be selected for the market orchard, and a tract of high land, where the diluvial clays predominate, for the orchard which is to supply the home and the family of the true horticulturist.

# FORESTRY DEPARTMENT.

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## SOME PRACTICAL SUGGESTIONS ON TREE-GROWING IN WESTERN KANSAS.

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BY MARTIN ALLEN, HAYS CITY.

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I am much pleased at being able to report a heavy wood growth for the past season. In fact, the growth of almost everything has been luxuriant. The result is that our land is teeming with plenty. Wherever the plow and the hoe have been judiciously used, the result has been the ample reward of the husbandman for his labor, so far as plenty to eat, and farm crops being sold below the cost of production, can be considered in the light of a proper reward. So ample is the supply of everything that the croakers are suggesting a new objection to the country: they now say it is too far between trees. In this objection we concur; in this last ditch they can be sustained. Much work is being done to cure this objection. The strangest thing about the productiveness of this season is, that the rainfall is below the average of the last sixteen years; it has been a season without any floods, and with no excessive drouths. Upon the capabilities and resources of the country I have nothing to add to or detract from the vindication of it in my report to this body two years ago, (which has been so widely published and known as my review of Sargent,) and nothing to either add to or subtract from the list of trees, or the manner of growing them, submitted to you in my last report one year ago. Yet if such seasons as the one just past should become the rule, that list might be lengthened out almost indefinitely. But we think it best to hold fast to the old list of forest trees—a list that has been forced upon us by adversity. It will not be best now to forget this list during a period of success which may be only temporary; let us not forget the lessons of our failures, even while we appear to be successful.

The more general planting of forest trees ought to be encouraged along the sides of our streets and highways, upon the lawn, about our buildings, and upon waste places and isolated corners about the farm, as well as in wind-breaks and forests, where their planting has heretofore been generally advised. If long lines are to be planted, let the ground be prepared by twice plowing a few furrows, once in the previous summer or early autumn, and once in early spring, turning the furrows outward at each plowing. The dead-furrow thus made will probably be deep enough to plant in without the laborious work of digging holes. The leveling up after the planting can be mostly done with the plow, and if the trees be small, say two and a half or three feet high, the cultivation can for the first year be done with a riding cultivator; afterwards a light annual plowing in June for three or four years, sometimes turning the furrow towards and sometimes away from the trees, and mowing the weeds immediately in the row where the plow cannot reach will do, although twice plowing, once as soon as weeds get well started in spring and again at beginning of harvest, and hoeing out weeds in the row, would be much better.



In this way a row of trees may be grown with almost unerring certainty, and with very little expense or labor, and when once well established would not be sold for ten-fold the cost of production. They will often add a hundred times their cost to the selling value of the property to which they belong. These trees should not be crowded up by untimely and unnatural pruning, but the tops should be induced to shade the trunks as much as possible. For the better accomplishment of this result, care should always be taken with each tree to have the lowest limb of the top on the south side. This precaution alone, it is believed, will quite often defeat the efforts of that intolerable pest, the flat-headed borer. It seems that this insect is almost powerless to do mischief in the shade. This precaution in pruning will also be some help towards keeping the tree in an erect position. A very material additional help can be secured by once or twice during the season of active growth pinching the ends of the leading shoots on the north side of the tree, while it is small and can be easily reached. By these two methods it is even possible to grow erect trees upon the Plains, where by many it is thought a very difficult thing to do.

These suggestions about planting are quite as applicable to fruit trees in the orchard as to forest trees upon the margin of the highway, and these directions about pruning are intended to be of universal application, in the orchard, in the forest, or upon the lawn. I might also add, prune sparingly, and only while the tree is in an active growing condition. If done at such time, and the cut is properly and smoothly made at the junction of the limb with the tree, nature at once proceeds with the formation of a ring of new wood, holding the newly-cut part firm against all damage by cracking, and the process of soundly healing over proceeds without delay. When a limb is cut off in the fall, winter, or early spring, nature is then powerless to proceed at once to repair the wound; the cut cracks, and these cracks take up water from subsequent rains, and the result may be acidity, decay, and permanent injury to the tree. In this connection I might add, when a large limb is to be removed it may be sometimes well to hold it in check by pinching its ends, and allowing it to grow but little for one or two years previous to final amputation. The growth of the tree has in the meantime gone on, and when the limb is finally taken off, the size of the wound is much less in proportion to the size of the tree, than if it had been cut off without this preparation.

Sprouts from the crown or near the surface of the ground, which are so annoying to many persons attempting to grow trees, may to some extent be avoided by keeping the tree in an upright position, and an annual washing of the trunk with some alkaline substance to keep the bark youthful and vigorous will also be a help; although sometimes in case of a diseased or damaged top or trunk, a sprout will be found a good thing, especially if one can be induced to start on the south side. Such a sprout will often make a surprising growth, because of its bark being thin, young, and vigorous—having just the properties that are induced in the older tree by an alkaline wash. Sometimes also, in case of accidental or other wounds, such a sprout may be cut near the top to a proper slope, and the bark opened above the wound and the top of the sprout so cut inserted and tied; when it grows fast, as it generally will, it will aid very materially in restoring the diminished circulation between the root and top, by reason of the existing wound.

As long ago as August or September, 1859, I was present at a discussion of the question of fruit-growing in northern Illinois. One gentleman ridiculed the whole matter, and inquired what was to be done with the rabbits. Another answered if there was no other remedy, he would fence them out with a stone wall. At that time, rabbits were vastly in excess of stones; the former were a natural home product, but the latter had to be imported. Since that time I have had a large experience with rabbits, and I am quite frequently interrogated in regard to the best manner of saving trees from these pests. While there are many ways, any of which may be partially successful in coping

with, them, I really think most favorably of the remedy afforded by cats and dogs. A good, active English shepherd dog will readily take to hunting them, and his efforts are often rewarded by an ample meal of his own capturing.

My apology, if any be needed, for sandwiching this rabbit business into this report, is that these rascals sometimes eat forest as well as fruit trees; in fact, they are quite uncertain in their selections of food. The rule seems to be with them as it is with the goat—everything you don't want them to eat is just what they are sure to eat.

You will, as a matter of course, expect me not to close without recommending mulching and saying it is a good thing; but while doing so I want to softly whisper in your ears the declaration that persistent and continuous cultivation is much better.

I don't want to let this meeting pass without calling your attention to the great value to be derived from an experimental station, to teach by example in the field how to deal with forestry. Some of the older States have established stations for the promotion of agriculture, which in this State is amply able to take care of itself; but the forestry interest (the importance of which can scarcely be realized) is flagging for want, in a great measure, of knowing how, when, where and what to plant; how to prepare the ground; what sort of ground to use; relative value and cost of the various products when grown; and a thousand other equally important questions, that no one is able to answer with any degree of certainty. The probability is that more hard work and real effort are now being annually expended to no purpose, in this State, for the want of knowledge upon these questions—more, I have no doubt, than would be necessary to establish and keep in motion 500 such experimental stations. Such an experimental station should be out in the field, somewhere upon the region known as the Treeless Plains, and need not be a kid-glove affair, with an office in the capitol. States both east and west of us are considering this question, but Kansas should be the first to reap the rich rewards of such an institution; and will be if the men who shape her legislation can only be brought to realize the necessities of her people, and their need of help to overcome her very small natural supply of forest.

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## FORESTRY IN SOUTHWESTERN KANSAS.

BY J. B. SCHLICHTER, STERLING.

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1. There is no new departure nor any new development in this industry to report. We very much desire to speak of large timber plantations. Trees are planted for shade, for ornament, and for wind-breaks. This is good, and there should be a great deal more of it done. But what we would very much desire to see, is large timber plantations as an investment for profit.

2. However, the question of forestry is becoming more and more settled each season; i. e., what was a question a few years ago has become a *fact*. There has now been enough done by way of experimenting to settle the question of timber culture *for profit* in the Arkansas valley. A person can now select tested varieties of trees, and plant confident of success. The wonder is why some one does not engage in the enterprise.

3. The main question now seems to be, *How far west may we grow timber profitably without irrigation?* We hear of persons holding timber claims in Edwards, Rush and Ness counties on upland, and it is said they are making a success of raising timber there. I am informed that native timber of the following kinds is found in Ness county: Elm, 3 feet in diameter; Cottonwood, 4 feet; Ash, 2 feet; Hackberry, 18 inches. I am also

informed that the Hackberry is found growing on the dry and arid plains of Arizona. With these observations before us, it would seem that these native varieties might be grown almost anywhere in western Kansas.

4. I shall therefore feel safe in venturing some recommendations.

(1) In selecting a location, the top of a hill or a southern slope should always be avoided. A northern slope, if not too steep, might do; but should prefer a low, flat piece of ground—a place where water would be more likely to accumulate during a rain-fall, rather than to drain off.

(2) The Elm, Hackberry, Ash and Cottonwood being found native in these regions, I should recommend them first. The native Elm is certainly a valuable tree, and for a shade tree no better can be found.

(3) The Honey Locust, Yellow Locust, Russian Mulberry and Ailantus seem to be able to resist the drouth better than most other foreign varieties. All of these yield valuable timber.

(4) Basing a timber plantation upon these three recommendations, with thorough preparation of the soil by deep plowing and subsoiling, the careful planting of sound trees, with good and thorough cultivation, it certainly will be successful almost anywhere beyond the one-hundredth meridian.

5. This report would be incomplete without some further notes on varieties.

(1) The Walnut should always stand first in the list of trees to be planted. It is the tree of promise. Too much cannot be said in its favor. We know it from "fore-fathers'" time. When young, it makes a very ornamental shade tree. When old, it is majestic, stately and grand. There is no part of it—neither root, branch nor stump—but finds its way into the household in most beautifully wrought cabinet work. As a valuable timber it excels all others grown in this country. It succeeds well in the Arkansas valley, especially on bottom land. Its long tap-roots soon reach the water, and will draw moisture from below. Its strong, heavy limbs and strong trunk enable it to stand erect in the wind. Its fruit is not only an item of luxury in the family, but has also a market value.

(2) Second in the order of value we shall mention the *Catalpa speciosa*. It has thus far proved to be what has been claimed for it. It is a rapid and erect grower, and bears transplanting better than any other tree in our whole list. It is better adapted for a forest tree than for shade or ornament.

(3) The Yellow Locust still holds out against the borer; no insect of any kind has yet attacked it. Thus far it proves itself to be what we have in former papers claimed for it. If it will escape the borer as it has done up to this time, in this part of Kansas it certainly must take a front rank among valuable forest trees. Its growth is nearly equal to the Cottonwood. When once established in the soil it will remain there. The objection rendered against the tree on account of its sprouting propensity is no objection in this country for a forest tree. When a tree is large enough for use it may be cut out and there will soon be from three to a dozen trees to take its place. It may be grown on poor soil or exhausted land with great benefit to the soil.

(4) Our native Elm is a tree that deserves to come into notice. We have already mentioned this tree for the Western Plains. We have trees in Rice county which, if not so large, are more beautiful and perhaps as venerable as the notorious "Washington Elm." Perhaps they are as old, and possibly have a greater history. Who can tell what they have endured in reaching their magnificent stature? Some of them are standing alone, and are, perhaps, the only survivors of a long-forgotten and youthful forest. If these trees have withstood all the vicissitudes that have befallen these plains for more than a century past, may we not safely plant them for the benefit of the "third and fourth generation" to come?

(5.) We cannot in this report mention all the trees that are beautiful and valuable for this section of the country. We must conclude by mentioning one more, viz., the Red Cedar. This being one of our native varieties, it ought to find place in our plantations. The greatest drawback to making large plantations of this tree, is that it does not readily bear transplanting; in other words, it does not bear handling. Those that are shipped here and handled by *tree agents* usually fail to grow. Tree agents usually do not understand handling evergreens. They are commonly dead by the time they reach their customer. It is, no doubt, best to get these trees direct from the growers, who are responsible for good packing and proper handling. There are men in this business who make a specialty of growing evergreens, who can give proper directions to their customers for planting. The Red Cedar does exceedingly well here after it has become thoroughly rooted. It withstands drouth, and will grow in a yard covered with sod.

## WHAT HAS BEEN DONE FOR FORESTRY?

BY F. P. BAKER, SPECIAL AGENT U. S. DEPARTMENT OF AGRICULTURE.

In assigning the writer a subject for a paper to be read before this meeting of the State Horticultural Society, the theme selected for him was, "What is the present status of governmental effort to promote the interests of forestry in the United States; or, What has organized effort accomplished in the endeavor to encourage forest-tree planting, and to preserve timber already growing?"

This, considered as one question, or two, affords a very wide field. In fact, it opens up the discussion of all that has been done by the General Government, by State associations, by local horticultural and forestry associations, and by individual tree-planters in the United States. I have decided to "lump" the subject, so to speak, and allude briefly and in a general way to the nature and result of all sorts of effort, public and private, general and local, under the head, "What has been done for forestry?"

Governments, it will be understood, originate, discover and invent few things, and our own is no exception to the rule. No government ever discovered the power of steam, electricity, or new mechanical forces. It was not a government that discovered gunpowder to mangle men with, or chloroform to aid in repairing its damages. It is very seldom that a regular official of a government ever strikes out in a new path, or develops a fresh idea. The thinking in this world is done by private, and frequently obscure, men. In time their ideas become the property of the community, and lastly they are adopted by the government.

The United States Government, when established, possessed absolutely the most magnificent forested domain on the face of the earth. Even after a century of spoliation and waste, as well as legitimate sale and transfer, it is still magnificent. Exactly how large it is, is not known, but in 1880 it was estimated that the United States owned 85,000,000 acres of timber land.

This is a mere fraction of what the National Government once owned, and which was parted with, or stripped, burned, or stolen from, with scarcely a thought of its value.

When it is asked why the General Government did not long ago establish a system of protecting its forests, the answer is easy; it is, that it is not long since the Government of the United States began to encourage anything.

The political theory which became dominant within a score of years after the adop-

tion of the constitution, belittled the Federal Government. Men debated whether the General Government had the right to do anything, even to improve rivers and harbors. The authority of the United States became a shadowy uncertainty. Of course under this theory of authority the Federal Government could do little toward encouraging anything useful. Had it not been for the arm acting under the War Department, it is doubtful if the domain of the United States would ever have been carefully and scientifically explored.

All did not see the General Government's doing in the way of encouraging agriculture by the regular dissemination of seeds and cuttings; by the appointment of agents to investigate matters affecting the farmer, the stock raiser and the orchardist; all, in short, that comes under the supervision of the United States Commissioner of Agriculture, is a new and modern invention. There was a time when the sending out of a package of garden seeds by authority of the Federal Government would have been deemed an infringement on the "reserved rights of the States."

The United States for many years then did nothing to encourage forestry either in theory or practice. Probably the first trees set out under the authority of the Federal Government were those in the Capitol grounds at Washington, planted under the supervision of the first American landscape gardener, A. J. Downing. Those who have seen these trees can testify that they are not yet very large. As to the extensive planting of trees on the streets and in the public grounds of Washington, that is the work of the last fifteen years. The General Government is a very young forester.

The Department of Agriculture assumed its present shape about twenty years ago; but the Division of Forestry was organized not over five years ago, and with its organization the interest of the Federal Government in the preservation and growth of forests may be said to have begun.

As I said in beginning, governments originate little or nothing, and it was not until after years of effort on the part of individuals in different parts of the country, not until men like Dr. John A. Warder had devoted years to writing and speaking on the value of forests, that the Government of the United States really took hold of a matter which should have engaged its attention at least a hundred years ago.

The passage of the timber-culture act was one of the first steps taken by the Government in recognition of the necessity of tree-growing on our Western prairies. There is a wide diversity of opinion as to the practical workings of that law. For myself, I have no hesitation in saying that the law has done a great deal directly, and much more indirectly, toward covering with forest trees great tracts which would otherwise have been left bare to be scorched by the sun, swept by the hot winds, and aid in perpetuating the reign of drouth and grasshoppers in this Western country. In the first place, many have complied with the terms of the act; and in the next place, the presence, the successful growing of one grove in a region before supposed naturally incapable of supporting tree-growth, has led to the planting of other groves, plantations and belts. Let any man visit the counties of Kansas, settled since the passage of the timber-culture act, and he will see more trees growing than were to be seen in prairie countries settled before the passage of the act and within ten or fifteen years after their first settlement.

The position taken by the Government in the passage of the timber-culture act strengthened the growing sentiment in favor of forestry—it, so to speak, made forestry fashionable. If Kansas people wish an illustration, let them look at Wichita as it stands embowered in trees to-day; and remember how Topeka looked fourteen years after its settlement.

The principal advance made in what may be called the forestry work of the Government has been, since the establishment of the Department of Forestry, in the dissemination of knowledge. The exhaustive scientific reports of Dr. Hough are well known,

but desiring to familiarize the subject, if I may use the expression, the Forestry Division resorted to the employment of special agents instructed to collect facts and embody them in reports clothed in the plainest language, and unburdened with superfluous matter.

The writer had the honor, even in advance of the appointment of these agents, to make a report on the forestry systems of the different countries of Europe as illustrated at the last Paris Exhibition.

Since their appointment, the special agents have, I may say not boastfully but truthfully, diligently carried out their instructions. A very brief notice is made of their labors in the report of the United States Commissioner of Agriculture for the year 1883. A still more concise notice of the work of the agents may not be uninteresting, as part of the history of what the General Government has done for forestry.

One of the agents appointed was Dr. John A. Warder, of Ohio. His life prior to his appointment had been devoted to horticulture and forestry. I do not need, in a company like this, to speak of his great merits and services in the department of knowledge he had made his own. Had he lived he would have done a great work for the Government, but his death occurred shortly after his appointment, and his field was left to be worked by others. Hon. John W. Furnas, of Nebraska, was one of these, and he has added to the literature of forestry a clear and interesting report on the forests of California, Oregon, Washington Territory, and the western slope of the Rocky Mountains. Gov. Furnas's report is especially valuable in its figures respecting the destruction of timber in that district. Gov. Furnas has also contributed an interesting report on timber-growing on the treeless plains of Nebraska. This is of special value to Kansas tree-growers. The writer, acting as a special agent, furnished early in 1883 a preliminary report on the forestry of the Mississippi valley and tree-planting on the Plains, and subsequently a supplemental report covering more particularly the forest resources of the Southern States. In the preparation of these reports the information received in response to thousands of circulars was utilized; the instructions of the department being explicit as to the accumulation of facts rather than of theories.

Other reports were made, but these are mentioned as relating more to matters in which you are interested; and in this connection I may say that in the collection of information in regard to tree-planting on the prairies I have been greatly aided by gentlemen whose names have long been known and honored in this Society.

It may be said that official reports made to any department of the government are slow in reaching the public, appearing annually in cumbrous and uninteresting-looking volumes; but the reports herein mentioned have been more fortunate. Their brevity has made it possible to publish them in pamphlet form, and they have reached the public within a few weeks of their reception by the department.

The reports thus scattered broadcast by the Government have been copied by the newspapers of the country, two or three of them, to my knowledge, having appeared in full in four hundred newspapers, and extracts from them in thousands more. The National Forestry Congress is now publishing weekly bulletins or "leaflets," in which the points made in the reports of the Government agents are given, with other matter relative to the cultivation and care of forests.

We may briefly sum up the present attitude of the Government in regard to forestry, as follows:

The Government, by the passage of the timber-culture act, committed itself to the encouragement of tree culture, and even though the act should be repealed, its principle will be preserved in some other enactment.

The importance of forestry has been recognized by the erection of a Forestry Division in the Department of Agriculture, the present chief of the Division being Mr. N. H. Eggleston.

Special agents have been appointed, to whom has been assigned the duty of investigating the needs of different portions of the country in the matter of the protection and culture of forests.

A regular system of disseminating information has been adopted by the Government.

As a result of all this, the Government may be said to have informed itself of the extent and condition of its own forest domain, and something has been done, though manifestly not enough, toward protecting Government timber from spoliation and destruction.

Finally, every believer in trees may take courage from the present attitude of the Government, and hope that in time, the wise example set by other governments, as for instance, France with her "Bureau of Woods and Waters," may be followed by our own.

I have alluded to the National Forestry Congress; and in these congresses, or in political language, conventions, we have proof of the great and rising interest felt in the subject of forestry. These meetings are not official in their character, but Hon. George B. Loring, Commissioner of Agriculture, evinced his interest by attending the great meeting at Montreal, and the agents of the Forestry Division were instructed to attend the meeting at Minneapolis. Full reports were made to the department concerning these meetings.

Considering the brief period during which the Government may be said to have been interested, it may be fairly said that great progress has been made.

After all, thankful as we should be that the Government is becoming enlightened, the question of tree-growing and tree-preservation rests with the people at large. The Government owns, as has been said, 85,000,000 acres of timber, much of it on the Rocky Mountains; but what is that to the area owned by individuals and by corporations? And what is the condition of public sentiment generally in regard to forestry?

I need hardly remind those here present, many of them Kansans of long residence, of the immense change they themselves have witnessed in public opinion in regard to the capabilities of our State. You remember when it was said that fruit trees would not grow in Kansas, when blue-grass would not grow in Kansas, when even potatoes would not grow in Kansas. In fact, so few things were allowed to grow in Kansas that it was something of a mystery that anybody came here with the expectation of tilling the soil. You have seen how experience has changed all this. You have seen orchards planted in the face of incredulous comment; you have seen the trees grow; you have seen them bear; you have eaten the fruit. You have lived to see the time when apples, for instance, have been shipped from Kansas, on the same day, to Minneapolis and Mobile.

You have noticed, with the assurance of success, the rising interest felt in horticulture; you have noticed that, because you are interested in it. Let me tell you that there has been a corresponding increase of faith and works in regard to forest trees.

You can take into consideration the larger area of cultivated ground in Kansas, the larger agricultural population, and estimate for yourselves what has been done in our State.

As an example of what has been done, I can cite the States of Kansas and Nebraska. In the latter State it is estimated that there are growing 53,000,000 forest trees planted by the hand of man. I suppose it is safe to estimate the same number to the acre as is required under the timber-culture act—that is, 675. This would give a little over 78,000 acres in forest trees in that State.

In Kansas the statistics given by the report of the Secretary of the State Board of Agriculture show 119,682 acres. If we make the same calculations in artificial forest trees as to the number planted to the acre that we have in Nebraska, it would show the number of trees in artificial forests in the State to be 70,486,350.

It has generally been conceded that Nebraska was far ahead of Kansas in the number of forest trees planted; but if I'm right in the above calculations—and I do not see but that I am—Kansas exceeds Nebraska in the number of trees planted out by 17,486,350, and in acres, 41,682.

It must be remembered that the above estimate does not in either State include the number of acres of trees of volunteer growth. That this is very large, every observer knows; and that it is equal to at least fifty per cent. of the number of artificial growth, is quite evident.

I have not an estimate of the number of fruit trees in Nebraska, but the authority I have given above states that of all the varieties of fruit trees in Kansas there are 20,851,276. Reduce this to acres, at 40 trees to the acre, which is believed to be a fair average, makes 52,128, or a total acreage in forest and fruit trees, almost all set out during the past fifteen years, of 171,810.

Besides this, there are 6,228 acres in small fruits, and 3,865 acres in vineyards.

The sentiment in regard to the value of trees prevails in all the prairie States, and is especially strong in the States west of the Mississippi and the Missouri. Minnesota has a State forestry association, Colorado has just formed one, Nebraska invented and proudly maintains Arbor Day, and how much Kansas thinks of trees, you yourselves are the best judges.

In the timbered States there is a growing sentiment against the wasteful destruction of timber, but as this sentiment conflicts with the self-interest of the destroyers, slow progress is made. We in the West can say to the Eastern slashers, "Go ahead, and chop down your forests; dry up your streams, and convert your hillsides into gullies; but we, wise men of the West, will make trees grow where you say it is still desert; we will bring depth and a constant flow to our streams; we will change the sky itself, and make it rain where it did not before; and if that fails, we will dig irrigating ditches hundreds of miles long, and plant trees the whole length of the Arkansas river."

That all this is not impossible, you, gentlemen, know.

The constant discussion of the subject of forestry, the immense accumulation of experience, the demonstration of what man has done, give hope of what man may do.

The only thing to be done now is to get away from experiment, and go into the business of forestry on what Americans call a big scale. We must accustom ourselves to speak of a hundred or a thousand acres of trees, just as we now do about so much corn. It takes but little more time to plant a mile of trees along the highway, than it does to set out a dozen trees in a dooryard. We were—we older men—born in an age when men put in a lifetime chopping down trees. We have fortunately lived to see the first development in this country of the new art of forestry—the art of making trees grow. Everything is in its favor. Let us do our part in the great work, resting assured that we shall be doing a good part for ourselves and the generations to follow us.

## PLANT. FOREST TREES ON THE WESTERN PRAIRIES.

BY DR. W. M. GOODWIN, LA CROSSE.

"To him that overcometh will I give to eat of the tree of life." This should be the text of every settler in a new country, for *overcome* is the one thing needful before a new country can be developed, comfortable homes made, a living assured, and sufficient harvests garnered to supply their wants.

East of the Mississippi they had dense forests to overcome (in many places), and



roads to grade, bridges to build, ditches to dig to get rid of surplus water, before the country was sufficiently developed to render it a desirable place in which to live. In all new countries there is much to overcome, and probably Kansas has less to overcome than any of the Eastern States; and the same labor and care will make a success in Kansas in less time than was spent in developing Illinois. If on the Plains as much labor and money be spent in damming creeks and draws, making ponds and lakes to hold the water, as was spent in some of the Middle States to get rid of the surplus water, we would hear no more of drouth on the Plains than in Missouri.

Very few settlers in western Kansas have for their motto, *overcome*, and they think but little about the climate and how to overcome drawbacks, but stubbornly stick to ideas and modes prevailing in the older States, and attempt to force the country to yield a fortune or wealth in a few years.

I will venture the prediction that with thought and suitable culture, farming and forestry will be a success far beyond the west line of the State of Kansas. If we look at business men, merchants of all kinds, it is not difficult to see that they fail because their effort is to make money, without much thought about doing everything on correct business principles, which only will assure success in anything.

In riding over the western part of Kansas, it will be observed that the natural plants and trees are generally small or cut-leaf sorts, which thrive best. Now if we would improve these Plains and have the country dotted over with groves and forests, it will be well for us to imitate nature, and plant such as will be more nearly in harmony with what nature has begun, such as the Locust, Hackberry, Walnut, &c.—they *do* succeed now. If we would plant groves (small ones) on every farm, of the smaller kinds such as Plums, Choke-cherry, &c., it would have a wonderful influence in changing the climate and the production of crops, and in a few years trees that fail now would succeed.

I wish it understood, that from my experience and observation on the Plains, that I have no doubt of the ultimate success of forestry, even beyond the western limits of the State of Kansas. "Will it pay?" will be asked by most farmers before planting trees of any kind. If five acres on any quarter-section of land in Kansas be planted in forest trees, properly selected as to kinds, well cultivated and cared for twenty years, the timber will be worth not less than two hundred and fifty dollars per acre, and probably two or three times as much. Calculations have been made so often, showing number of trees and cords of wood that may be grown in ten or twenty years, that I think it unnecessary to repeat them here, but will refer to calculation made by Hon. Martin Allen, of Ellis county, and which may be found in the Report of the Kansas State Horticultural Society for 1883. I know of one Walnut tree which was sold for \$75 twenty-five years from planting, and there is no reason why one hundred trees would not do nearly or quite as well on an acre, if well cultivated, as that one. A farmer in Illinois planted ten acres to White Ash and Soft Maple—every third row maple; and at the end of ten years sold the Ash for two thousand dollars. I will not say that such results can be reached by all who plant forests, but will say that those who plant and properly cultivate a few acres will be worth about the value of the forest more than they will be if they do not plant.

But the value of the timber will be of minor importance on the treeless Plains, for a few acres on each farm will so affect soil, climate, rainfall, etc., in short, the conditions necessary to produce crops, that the increase of all farm products will far exceed the value of the timber.

As long as settlers on the Plains attempt to force methods adapted to States east of the Mississippi on this treeless country, they will fail to succeed; but with a knowledge of climate, soil, and what and how to plant, there will be no more trouble to have forests all over the Plains than there has been in other prairie States.

Let every farmer plant all he can care for of Cherry, Plum, Peach and Apple trees,

and such forest trees as are known to succeed; and then it will not be many years till the large, broad-leaved trees will thrive. Let each land-owner strive to understand the rainfall, climate, soil, and all the disadvantages of the Plains, and then plant trees that do succeed now, and in a few years what are now regarded as treeless plains will be covered by groves, and pleasant homes surrounded by evidences of thrift, prosperity, and happiness.

## COLLECTING, CARING FOR AND PLANTING SEEDS AND YOUNG TREES.

BY J. F. MARTIN, WINFIELD.

1. Seeds maturing in spring, and that should be planted as soon as gathered: The Elms—white, red or slippery, and corky; Willows, Cottonwood, Maple—red and white. The Willow, Elm and Cottonwood, having very small seeds, must be covered very lightly and kept moist until they germinate, by a partial shading and daily watering. All the above kinds will be greatly benefited, and perhaps saved from sun-scald, by partially shading them until they are two inches high; removing a part of the shading at a time until all is removed.

2. Mulberry, native and Russian, ripen their seeds in June. The berries should be carefully crushed and the seed freed from the pulp, and sown at once, covering lightly, and treat as above stated with other seeds. They may be kept until the following spring, but one year will be lost by doing so.

3. Linden or Basswood ripens its seed the last of July, and it should be gathered as soon as the seed-pods begin to turn yellow, and mixed with sand to prevent heating as well as drying, placed in some vessel in the cellar, and kept slightly moist until the following spring. Do not plant too early, as they come up quickly and are liable to be killed by late spring frosts.

4. The following kinds ripen in autumn, and should be planted soon after being gathered, or preserved in a moist condition until spring: Hickory, Pecan, Oak, Ash, and Maples, which ripen their seed in the fall. On account of the danger from mice and squirrels, neither Walnut, Butternut nor Persimmon should be planted until spring. Hickories, Oaks, Walnut and Butternut may be put on the ground and slightly covered during the winter, where you may see that the above-named enemies do not rob you. The Pecan, Chestnut, Persimmon, Ash and Maple, ripening in the fall, should be treated as directed for keeping Linden seed.

5. Seeds ripening in autumn that can be kept in a dry state and safe from mice are, Catalpas, Red Bud, Ailantus, Green Ash, and Ash-leaved Maple.

6. Dogwood, by cleaning the seed from its pulp in the fall, and packing in sand in the cellar or in a box out of doors, and planting in early spring, may sometimes grow, but often the seed will not germinate until the second and sometimes the third season. Red Cedar seed should be saved and cleaned the same as the above, but should be left in the box in open air, thus subjecting it to the freezing of winter. Plant in moist, well-prepared soil, in early spring; cover one-half inch deep and partially shade during the entire season, and allow the bed to remain undisturbed through the second season.

7. Kentucky Coffee Tree, Honey Locust and Black Locust seed must have scalding water poured on them until just before they are planted. Osage seed must be soaked in water for several days, changing the water each day to prevent souring. If the water is

kept tepid warm it will hasten their sprouting. When the sprouts begin to show, they should be planted in shallow drills, and the cuttings covered about one inch deep.

8. Cottonwood, Willow, Ailantus, Catalpa, Black and Russian Mulberry can be propagated by cuttings taken from last year's growth. The cuttings should be ten inches long, and cut before severe freezing occurs. If cut immediately after the falling of the leaves and buried in a half-upright position with butt ends down, covering them near or quite to the tops, and left thus until early spring, and then forced down in a half-inclined position to the same depth, in deeply-worked soil, either in nursery rows or where they are to remain permanently, but a small proportion of them will fail to strike root and grow. Another plan is, after making the cuttings and tying in small bundles, they are inverted in a trench, say twelve inches deep, top end down, and thus left to callous until early spring, after which they are planted as above directed.

The Cottonwood, Ailantus and Willows are readily propagated from cuttings prepared and treated in almost any manner, but Catalpa and the two kinds of Mulberries I would not propagate in this way, as they grow readily from seed and make much finer trees.

In growing trees, the seed-bed should be deeply worked and well pulverized, and if the bed is free from weed and grass seed, the seed may be sown broadcast; if not, then sow in drills one inch or so deep, covering the seed from one-fourth to three-fourths of an inch deep, being governed chiefly by the size of the seed; the larger the seed the deeper you may cover them.

The Maples are quite easy to grow, and require very similar treatment as given in growing a crop of corn.

All trees having a strong tap-root and not many lateral roots, such as Walnut, Butternut, Hickory, Pecan, Persimmon, and Oaks, should be planted where they are to grow, as they do not transplant well. All these should be grown in nursery row or bed, and transplanted at one year of age. It is apparent that 10,000 seedlings can be grown and taken care of in this manner and transplanted where they are to remain, at less expense of labor than in growing the same number scattered in hills four feet apart over nearly four acres of ground. Always prefer one-year-old trees for transplanting. Older trees will do well, but require especial care in handling, etc.

Locusts, Mulberries, Catalpas and Osage seed should be sown in drills, three feet apart. The drills are best made by an ordinary corn marker; the seed dropped, say forty of them to a foot. The best tool to cover the seed with is a steel-toothed rake, drawn rapidly back and forth across the drills, being careful not to cover them too deep. As the sprouts begin to burst through the ground, by dextrously using the rake as above described the crust will be broken, and all small weeds destroyed. This will save much future labor.

#### CULTIVATION OF NURSERIES.

All nursery trees should be kept clean of weeds, and the ground well cultivated until about the middle of August, when cultivation should cease, that the young trees may properly ripen their wood. These directions are applicable to a forest plantation as well as to orchard and berry patches. In collecting seeds and cuttings, care should be given to get them from trees of vigorous growth and fine form.

One tree I have neglected to name in this article; that is the Sycamore. The buttons containing the seed may be cleaned and treated as directed for Basswood or Linden. It may also be grown from cuttings, treated as described under that head.

#### DIGGING AND HEELING IN.

We have now come to the last of October and November, the nursery trees being of one season's growth. They should now be lifted with the spade, or, if there is a quantity to be taken up, it can be done by running a two-horse plow deeply under the row. Count,

and assort the smaller from the larger trees. Then heel them in deeply in a trench, covering the tops one-half, that all may be protected from severe freezing and sudden thawing.

#### PLANTING IN SPRING.

In every case use all the facilities at your command in order to prepare the ground in the best possible manner by deep plowing and pulverization. Without occupying space in referring to the great number of the best authorities on tree planting, allow me to state most emphatically that the proper distance to plant trees is four feet each way.

Mark off the ground one way with a common corn marker, and furrow as deeply as possible the other way with two strong horses and a large plow. In handling trees, ever bear in mind that if the roots are in any material degree injured by mutilation or drying in the open air, the tree is to the same degree injured, and its life endangered.

The ground being ready, prepare a puddle of earth and water of the consistency of thick paint, into which dip the roots of your trees. Being thus heavily coated with mud, they will not injure by exposure until they can be planted. Each tree should be held in an upright position while the loose earth is drawn over the roots with a hoe or spade, care being taken to set them at the depth they stood in the nursery row, and that all spaces about the roots are filled with mellow soil; then pack the same by stepping on each side of the tree. To complete filling about the trees and the deep furrows between, throw a light furrow with a low-share plow or other suitable implement, towards the row. In planting, the help of a boy to carry and hold the trees in position will expedite the work.

#### CULTIVATION OF PLANTATION.

The cultivation of trees should continue three years, and be about the same as a good farmer would give his corn crop. If the soil is good, the cultivation may stop at the close of the second season, and the spring following the grove may be sown with red clover and used for hog pasture. If any of the trees head too low, or have any side branches that interfere with working them, such limbs should be cut off; but nature will ordinarily do the trimming in the best manner. If you wish to plant only a few trees, and do not want to cultivate them, by mulching heavily you will afford favorable conditions for success.

#### EVERGREEN TREES.

The roots of evergreen trees are extremely sensitive to exposure to the atmosphere, and especially a drying wind, so much so that they will live but little, if any, longer in the open air than a person will with his head under water. A lack of this knowledge or a proper attention to this point is a more prolific cause of the many failures to grow trees than all others combined.

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### PROGRESS OF FOREST-TREE PLANTING IN ELLSWORTH COUNTY, AND RECOMMENDATIONS.

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BY C. L. MYERS, ELLSWORTH.

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The planting of forest trees has been, perhaps, fully as successful, and more progress made in Ellsworth county during the past six years, than in any other county in the State as far west. I say the past six years, as that includes the time I have experimented here.

Experience is an expensive but thorough teacher. Through experience we have been enabled to select the best varieties, discard those that are worthless, and choose locations as regards soils, etc. This is a part of the progress made.

Six years ago our settlers were just beginning to become interested in forestry—but few timber claims, and fewer shelter-belts, trees for shade and ornament, had been planted previous to that time. We all started out with Cottonwood, principally, using some Walnut, Ash, and Ash-leaved Maple (Box Elder). The Cottonwood, where not well cultivated, did not last through the first season. Those receiving good cultivation “hung on” two, three, or four years, according to the location of plantation and soil. A few of these trees are yet to be seen; those in draws and low bottoms, sandy land, have made fine trees, and are still doing well. The Walnuts have generally stood drouths and neglect well, but have made a very slow growth—in fact, no headway at all, except on low, deep, loamy land. I have in my mind a grove of ten acres on second bottom, planted seven years ago; have been well cultivated, and the tallest of these trees are now less than six feet in height, except in a draw that runs across the lot, where they are perhaps ten or twelve feet high. The Ash-leaved Maple have generally been destroyed by borers. The Ash have stood the drouths and hot winds well, and made a fine growth, having more upright, straighter bodies, and in every way more valuable than any of the other trees.

These kinds were selected at that time because they were natives, and the seed or young trees easily procured. Later on, other varieties were introduced, such as Honey and Black Locusts, Osage Orange, Catalpa, Ailantus, and the Mulberries—Russian, black and white (I give no botanical names, as we have no use for them out West here—it is *trees that will grow* that we are after); these trees were more expensive, but crops being more abundant, and the land (timber claims) increasing rapidly in value, the settlers were able to experiment with them. These varieties, with ordinary care in planting and after-culture, have all done well—exceedingly well, in fact; so much so that no unprejudiced person could travel over Ellsworth county without being convinced that forest-tree growing had made rapid strides forward in the past six years. I could point out perhaps five hundred groves or plats of trees, of from a few specimens to ten or even twenty acres, planted from one to six years ago, that are a perfect success.

As to what the future has in store for us, we have no means of judging except by the past. There are enough trees of the kinds above named, eight or ten years old, large enough to make from one to six good posts, and fuel besides, to make the prospect very flattering, indeed.

As I said before, the progress made consists in finding the varieties that are adapted to our soils—resisting the ravages of borers and insects, withstanding the hot and fierce winds that sweep across our county every season. Where six years ago there was not an acre lot of timber in good growing condition, I could now point out, at a low estimate, 5,000 acres of fine young timber. In evidence of both success and progress (if the terms are not synonymous), allow me to introduce as witnesses some of my neighbors. One says: “While all my trees are doing well, out of some thousands of Honey Locust planted I have not lost a single tree from any cause.” The largest of these are six inches in diameter. Another says: “Almost every Osage Orange tree planted in the spring of 1883 grew; in 13,000 scarcely one missed, and they grew the first season two to five feet. Five acres planted in the spring of 1884 did just as well.” Another: “Did not lose a tree in 14,000 put out in 1884.” Another: “Did not lose five per cent. of 7,000 Black Locust planted in the fall of 1883, and now many of them are six feet high.” I planted at the same time 300 each of Catalpa, Ailantus, Russian Mulberry, and Honey Locust. Many of them grew last season three to six feet. Another man, whose trees have been planted two to five years (twelve acres), says: “My Mulberry, Catalpa, Ash and Locust can’t be beaten in any country.” And still another says: “I planted 27,000 trees in the spring of 1883, consisting of Soft Maple, Osage Orange, Catalpa, and Mulberry. It took less than 3,000 to replant in the spring of 1884, and now my trees are four to six feet high—a perfect stand.”

## RECOMMENDATIONS.

I would urge that large plantations, as on timber claims, be made on the south side, extending entirely across the tract planted, to protect the orchard, crops, stock and home from the south winds. The south winds do almost all the damage done by the wind in this country. Shelter-belts to protect orchards should be heaviest on the south side. In evidence of this proposition, I have never seen a Peach tree in the county full of fruit unless protected on the south side by a grove, building, or bluff. I know of an Apple orchard, part of which is protected on the south by a dense grove. The trees behind the grove bear fruit—the others do not. The limbs of Apple trees without this protection all point to the north, exposing the bodies of the trees on the south side to the sun, where they should be shaded from the start if possible.

Plant one-year-old seedling trees (because they are so much easier handled), four feet apart in rows both ways. Cut off the tops to within two inches of the ground. Cultivate thoroughly with plow and hoe (level cultivation is best) until the trees shade the ground enough to keep down the weeds. Plant in the fall if not too dry. Use kinds tested in your locality.

If my central Kansas friends will follow these suggestions they will soon be convinced that the much-talked-of "timber line," which a few years ago was supposed to cross the State a little west of Topeka, has moved on west of us. And I believe by planting forests we can gradually crowd this line west until eventually it will be pushed over into Colorado.

This work should be encouraged in every way possible—by county and State fair associations, by horticultural societies, and especially by Congressional and State legislatures. The timber-culture law should not be repealed. "The glaring frauds" under this act of Congress exist only in the minds of Congressmen and their strikers who know nothing of the workings of the law. I have watched this matter closely in this county. There has been some speculation, but to no greater extent than under homestead entries. The frauds are committed under the preëmption laws. But I am wandering from my subject. The Legislatures, especially of the States west of the Mississippi river, should offer a bounty for forest-tree planting—both on the roadside and on the farms.

## FORESTRY IN THE ARKANSAS VALLEY.

BY J. F. MARTIN, WINFIELD.

If from reading this article on forestry any brother farmer becomes more interested and better informed on this subject, and is thus induced to surround his home with the beauty and comforts of shade and protection, and supply not only his own wants for fuel, posts, etc., but in a few years, by not an over amount of exertion, be able to supply his less-intelligent and less-enterprising neighbors' wants, then this effort will not have been in vain. A self-consciousness of duty, faithfully performed, in calling attention to this question, that is a vital one to the State of Kansas, and to every one of her citizens, and thus inducing persons everywhere to engage earnestly in the work, is the only incentive of the writer.

I am aware that there are persons who appreciate this matter, yet, from lack of experience, or financial inability to expend money in buying young trees, they fail to do, from time to time, what they very much desire to do. To such I would say, Do not

become disheartened in this more than any other enterprise; but strike out boldly, manfully, with such means as you have, and if you cannot procure the most valuable varieties for planting secure the best you can get. Get Peach pits, and if they have remained in a dry state, if planted thus, they may not germinate until the second season, but by opening them carefully, and planting early in spring, they are quite sure to grow. If you cannot get such seed, you may be able to get some seedling trees, or find good pits under trees that bore the season previous. Plant in rows about six feet apart, and trees or seed from one to four feet in the row. Then you may procure young Cottonwood trees, or cuttings of the same, without the outlay of any money. Thus you may very soon produce your own fruit, and also firewood; and what is paramount to these, you and your stock will have the comforts of protection from the destructive wind storms; then, too, you will have the company and songs of insectivorous birds, to not only cheer, but also aid you in the battle with insect foes.

Such planting will form the nucleus for more extensive plantings of better kinds, and in a few years your farm will grow valuable, and not only a pleasant place to see, but a delightful place to live in.

#### KINDS TO PLANT.

In speaking of the varieties to plant for forestry purposes, no attempt will be made to give an extended list, or a scientific classification of the same; but I will name in a plain manner only such varieties as have proven successful in southern Kansas, and such as are valuable for the various purposes of the farm and the mechanic arts; preference always being given to those exhibiting the greatest degree of health and power of resisting the attacks of insects.

*Catalpa Speciosa* is a forest tree of large size, as found in lowlands of Indiana, Illinois, Tennessee, Missouri, and Arkansas. Though found native in the low, rich alluvial lands of the above-named States, its power of adaptation is remarkable. It is grown in Ohio and Pennsylvania, on the Hudson in New York, and as far north as Cape Cod; in the western States of Iowa, Kansas, and Nebraska—everywhere it is growing rapidly in favor. The writer knows of no tree having so many desirable qualities, with so few objectionable ones, and that we can look to with such hopeful anticipations of rewarding the planter to the same degree in the immediate future. It is easily propagated; transplants with fine success; grows rapidly; free from insect enemies; a beautiful tree, free from thorns; will not sprout from the mutilated roots; the leaves or bark are not liable to be eaten by stock; will sprout from the stump—thus the tree can be reproduced when desired; makes excellent fire-wood; the lumber is highly prized for furniture and wagon stuff, and the posts and railroad ties are next to imperishable, posts having been known to be in the ground for upwards of eighty years, and yet perfectly sound. I have no hesitation in placing it at the head of the list.

*Black Walnut*.—No description need be given of this indispensable tree. The lumber is now well-nigh exhausted, and the price has so greatly advanced, that in many instances several hundred dollars have been paid for a single tree. It is easily and cheaply grown from the nuts; free from disease, and usually free from injurious insects; the trees are not often injured by stock; it is adapted to upland and lowland, and no extensive plantation should be without a large proportion of Walnut.

*Green Ash*.—This, like the Walnut, is a slow grower, but the value of the timber in the various mechanic arts is so important that it should not be omitted from any considerable effort at forestry.

*Osage Orange*.—This is a medium slow grower, requiring twelve to fourteen years to make good fence posts, and twenty to twenty-five years for railroad ties; for grape stakes, eight to ten years. It has many of the good qualities of the Catalpa, with the difference of the Osage being a harder wood, susceptible of a very fine polish, so valuable for wag-

ons that it may be used for this purpose while green, it not being liable to shrink in seasoning. There is abundant evidence of the durability of the timber. Some who have been familiar with the native forests of Texas, and the various purposes for which the wood has been used for forty years, say they never had found a man who had ever seen the heart wood rotten. Prof. J. B. Turner, of Jacksonville, Ill., writes that he has bean and grape poles in his garden that have been in use at least twenty years; and that he no more thinks of housing an Osage Orange whiffle-tree or double-tree, if all of heart wood, than to think of housing his crowbars to keep them from rotting. This quality of the timber is an important matter to persons having old hedge-rows, the larger trees of which may be cut without material injury to the hedge, and used for various purposes on the farm. While the timber is durable, so are the thorns; this must be borne in mind, and while it would prove a great private and public benefit to have the Osage Orange largely grown, each planter must learn for himself whether he can bear the vexation and danger of the thorns. Leaving the thorns out of the question, it is one of the best trees for shelter-belts or wind-breaks.

*Soft Maple*.—It is a rapid-growing tree, makes a fine shade, but its wood is not especially valuable; is, like some others, liable to be attacked by borers.

*Cottonwood*.—This is so well known that a description would be superfluous. It is the most rapid growing of any of our forest trees. I took the measure of one tree in Vernon township that was of nine years' growth and measured sixty inches in circumference, and will make three-fourths of a cord of wood. This, with the Soft Maple, is preëminently the poor man's tree. The Cottonwood has, aside from its rapid growth, but little to recommend it. It should not be planted on thin upland, as it will most likely be early destroyed by borers.

*Morello Cherry*.—This fruit tree is here referred to on account, not of its fruit, as it is well known, but its adaptation to growing and doing quite well in prairie sod. I know of no tree that will succeed to so great a degree under such bad treatment.

The *Elm* (white and red) grows slowly, but at last makes a magnificent tree. Being well known, further reference at this time is useless.

The *Hackberry* is a native and well known, grows rapidly, and is rather a desirable tree.

The *Oaks* should only be planted on our bottom lands, as at best they grow slowly.

*Pecan*.—This is a valuable tree, not only for its nuts, but for mechanical purposes, and should be planted much more largely than it is.

*Ash (native)*.—The lumber of the Ash is in great demand, and rapidly increasing. It grows quite rapidly, and will be very profitable in the timber plantation. Objections are made to it on account of it being so prolific in seed, which, blowing to a considerable distance, is liable to soon spread over the farm, greatly to the annoyance of the owner. However, a few such on each quarter-section, for the present at least, might prove a great blessing.

*Honey Locust*.—This is also a native; is easily grown from seed; grows rapidly; is quite free from disease and insects' attacks; grows to a large size; and the wood is quite durable. The thorns are its great drawback. Its several good qualities overcome, to some extent, this objection.

*Kentucky Coffee Tree*.—This is a well-known and in many respects a very desirable tree. It adapts itself to most soils, and for all purposes for which the Honey Locust is prized is quite preferable. It is one of the few trees that have proved successful in western Kansas.

*Ash-leaved Maple (Box Elder)*, is a native of our section, and is well known. It grows rapidly, and makes a beautiful lawn and shade tree; well adapted to street planting. Its wood is not so especially esteemed as some others in the mechanic arts; yet for fire-wood



and purposes before named it should not be excluded. It is easily propagated, and transplants readily. A good syrup and sugar can be made from its sap, but it is not likely to be extensively planted for this purpose. It is well adapted to most soils and localities in this section. The chief difficulty in growing it is the borers, which frequently damage and sometimes destroy the trees. They should be headed low, so that their own branches or those of other trees may shade or protect their trunks from the afternoon sun, and kept in vigorous growth, and thus largely secure them from the borer's attacks.

*Black Locust.*—This, a well-known tree in the older States for many years, in most localities here is subject to the attack of borers; so much so that but little effort is made to grow it, and in fact it is only perpetuated by sprouting from the root and stump, which, as well as by seed, is the natural method of reproduction. Its wood is prized for its durability. The tree grows rapidly, attaining quite a large-sized tree in ten to twelve years. In rapidity of growth it excels most others, approaching that of the comparatively worthless Cottonwood. Where tried in the southern and western part of Kansas it seems to be perfectly at home, and more than meeting the expectation of the planter, and thus far it has been exempt from the attacks of its old enemy, the borer, but whether this favor will be continued is a matter of doubt and anxiety. It should be planted in ground to be permanently used for this purpose, as it will be difficult to get clear of it on account of its tendency to sprout from the roots. It would be well to include this valuable tree in your planting.

*Russian Mulberry.*—This is perhaps one of the most promising of a long list of exotic trees. There has been a great diversity of views expressed by those who have tried it in limited quantities. The main objection urged against it being that it is too dwarfish or spreading in its habit of growth. It is now claimed by its friends that it should be propagated only from seed, as only where grown from cuttings does it take the objectionable form. Certain it is that the Mennonites who came from Russia, and brought the seed with them, are meeting with eminent success in growing it in large quantities for hedging, for timber, and for silk-worm culture, in central and western Kansas. It is perfectly hardy, healthy, and free from insect enemies; transplants successfully; is free from thorns; grows more rapidly than our native black mulberry; attains a large size; and its timber is of the most durable kind. Nothing equals it for a wind-break. In reply to a letter inquiring in regard to this tree, Hon. L. A. Simmons, of Wellington, writes me that in consequence of its spreading habit he had not felt favorable to it until last season. He cut some of his trees to the ground, and from the stump he allowed but one sprout to grow, which grew upright, quite to his satisfaction. The trees that were not thus cut back produced a fine crop of fruit, which was relished very well by his family, and the birds gave them their exclusive attention while it lasted, and thus saved his crop of cherries. The young trees, grown from seed, can be purchased from reliable nurserymen at reasonable rates. I would advise planting them for wind-breaks and for their profit, for purposes above named; and ultimately, by judicious thinning, for timber. It makes a fine shade tree; and if you plant it for any or all of the above-named purposes, and at any time you desire to engage in silk-growing, which evidently is a coming industry for this State, you will have the food for the worms.

*Evergreens:* Red Cedar, Scotch Pine, Austrian Pine, White Pine, Norway Spruce, and Arbor Vitæ or White Cedar. Their relative success is about in the order named, and for the various purposes of the lawn and for timber are highly prized. It is claimed that the Red Cedar is the only native evergreen of which Kansas can boast; and right well has she made the selection. It grows even better here than in the Eastern States. It will attain a height of ten feet in a less number of years. The value of its timber is well known; it is quite ornamental; will bear any amount of shearing; is a fine shelter for birds; and as a wind-break nothing but a tightly-built stone fence will equal it. The other evergreens

named have a high merit peculiar to each, but in this section at this time are planted only for ornamental purposes.

### PROFITS OF FOREST TREES.

The following is condensed from estimates made by Robert Douglas & Sons, of Waukegan, Illinois, who make a specialty of forest-tree seedlings. They have planted for railroads extensive plantations; and their experience and honesty being beyond question, they are fully qualified to give correct estimates:

10,000 yearling plants (Catalpa), . . . . .	\$60 00
Freight and transportation, say \$3 per thousand, . . . . .	30 00
Two years' cultivation, three plowings each, at \$2 each, . . . . .	12 00
Total, . . . . .	\$102 00

On the farm of the Ohio State University such trees attained a diameter of four and three-fourths inches and a height of seventeen feet in five years from planting. In seven to eight years they would be large enough to make fence posts; but let us add fifty per cent. to this estimate, and call it twelve years, and let us suppose that the stand of trees has been reduced to 2,500 per acre. We would then have 2,500 posts, worth at least twenty cents each, or \$500. Many of the tops would make second-class posts, others being useful for poles, etc., and all valuable for fuel, thus more than paying the cost of clearing. Against this income we have to deduct the original cost of the plantation, with interest on the same for twelve years. Calculating this interest at six per cent., and compounded, the original sum will have doubled; and yet, after this handsome allowance and liberal calculation, there will be a balance left of \$296, or about \$9.25 per acre per annum for the use of the land. During the first season of cultivating the trees, if the ground is good, a crop of corn may be grown between the trees; and after cultivating the third year the ground might be sown to clover, and used for hog pasture, which would pay the rent on the land. On the basis of cash profits, excluding all other advantages of the grove, what farming operations pay better?

Ex-Commissioner Gale, of Cowley county, has growing on his farm in Rock township about five acres of Cottonwoods, the cuttings for which were planted in the spring of 1878. The distance is about four to seven feet; the cuttings were put eight to ten inches deep. He cultivated them two years, since which no attention has been given them. The trees are now five to eight inches in diameter, and forty feet high. Mr. Gale thinks that forty cords of wood could now be cut from each acre, which, if valued at \$3 per cord on the ground, would make a total of \$120 per acre, or \$600 for the five acres. This gives more than \$17 to the acre per annum. Much of this timber, if used for the various purposes of the farm where it could be kept above the ground, would be of much more value than if used for cord-wood. Mr. Gale regards this timber belt as nearly or quite equal to a straw shed as protection to stock in cold, windy weather. The value of the grove for purposes of wind-break, a protection to the birds, and in beautifying his home, are more than sufficient for the annual rent on land; so that with little care and expense he realizes a much greater cash return from this land than if he had cultivated the same in annual crops. If Mr. Gale was interrogated as to what part of his farm he regards as of the greatest value, no doubt he would reply that it is that part where his buildings, his orchards and his groves are located, and that if the orchards and groves were removed the farm would be greatly depreciated in value.

On the first of May, 1880, the writer planted 3,700 one-year-old Catalpas. The ground on which they are planted is divided by a draw or ravine, the soil of which is quite good for the purpose, but not better than most of the bottom land in this county. On either side of this draw the land is quite poor, resembling somewhat a gumbo soil. The trees were brought from Ohio the November previous to planting, and planted very late in

the spring, and the season following was the dry season; so that the conditions were unfavorable to success. They stand four feet apart each way. The first and second seasons they were plowed three times each and hoed twice, and two plowings were given them the third season; since which no attention has been given them. The trees standing on the poorer soil now average eight inches in circumference and seven feet high, and those in the good soil thirteen inches in circumference and twelve feet high.

## ESTIMATED COST.

3,700 plants at \$6 per 100, . . . . .	\$22 20
Preparing grounds and planting, . . . . .	6 00
Cultivating seven times, . . . . .	10 50
Two hoeings, . . . . .	3 00
Rent of land five years, . . . . .	25 00
Interest not exceeding, . . . . .	20 00
Total, . . . . .	\$86 70

There are now standing on the ground 3,600 trees, and no one would place their value at less than five cents each, which would aggregate \$180. Certain it is that the owner would not have the ground cleared of the trees for double the amount. Three years hence, and fence posts can be cut in order to properly thin the trees, when the yearly income may continue perpetually.

The following remarks are taken from an address by Hon. Emil Rothe:

"Many millions of dollars of American capital are invested in various enterprises which require a much longer time to yield profit and income, and never pay nearly as well as systematic forest culture in the proper locality. Great fortunes are risked in wild speculations in railroads which pay no dividends, in mining stocks which enrich only the agents or brokers selling them, in lands and lots which never attain the expected increase of value. But there is certainly no risk in forest culture. It produces an article of general and steadily-increasing demand, and it can be calculated with almost mathematical certainty what profit may be derived from it, and within what time. The fact that it is highly remunerative in all Europe, where land is much higher in price than here, should justify the expectation that it will be profitable here.

"Our soil and climate produce a much larger variety of valuable timber than any European country. Several species of American trees are now cultivated there very extensively, because of their superior qualities, and with a view to large profit therefrom. Our American Hickory, Black Walnut, Hard Maple and Wild Cherry, for instance, have none of their equals in Europe. They excite the envy of European carriage makers, furniture men, and manufacturers of tools. They are now largely exported from America, but the forest men of Germany and France are earnestly engaged in raising them for the home market.

"Now it is well known that on this continent forest trees grow much quicker and comparatively taller than in the Eastern Hemisphere. Here the most useful trees attain their full development in two-thirds of the time required in Europe, an advantage which can hardly be over-estimated. Locust, although being a very hard and solid wood, will make fence posts and pavement blocks in eight years from the seed, and large trees in twelve years. Its beautiful, golden yellow color, mixed with jet black, makes it well adapted for elegant furniture. Catalpa, which makes the best railroad ties, grows even quicker. Hickory, now largely exported to Europe and coming in great demand there, will prove exceedingly profitable. Sown in rows three feet apart, the nuts six inches in the row, the young trees will grow up straight and slender. In five years thinning out may commence, and hoop-poles may be sold; the next thinning out will give material for spokes and buggy fills; and the best trees left standing at proper distance will make a fine forest in less than twenty years.

"Black Walnut is a slow grower, but is getting so costly that it is worth while to think of planting it for speculation. Men below the age of thirty-five years will reap a rich harvest from the cultivation of this valuable timber before they have passed the best time of their life. A forty-acre lot of Black Walnut forest, now planted, will in twenty years make its owner independently wealthy, without requiring outlay or labor. I am told that a gentleman who, twenty years ago, planted twelve acres of land in southern Indiana with Pecan nuts made a fortune by it and created the source of a large yearly revenue."

If on every quarter-section now occupied in this State there were growing orchards, hedges, and forest belts to the extent of ten acres, the timber belts so arranged as to be most effectual in breaking the force of the winds, who would not say that the benefits to

the individual owners and the State at large would be incalculable? The advantages are plainly manifest in thus having wind-breaks, shade, fruit, birds, and then these trees growing year by year more valuable for all the purposes of the farm and the mechanic arts. If Omnipotence would decree that every forest tree, and every tree bearing fruit, and every beautiful flower planted by the hand of man, should die, and every effort hereafter made to grow these things should prove unavailing, we would suddenly awake to their just importance and wail over the desolation. Civilization will not, cannot, exist in a desert. The wants of man for timber in the mechanic arts, and the growing of the same for climatic purposes, will not be approached until at least one-tenth of the entire area of the country is covered with trees. So the planter need have no fear of overdoing the matter of planting trees.

## FORESTRY FOR PHILLIPS COUNTY.

BY J. W. KNODLE, DICKEYVILLE.

I have been in this county but comparatively a short time, and have had better success here with trees than in central Illinois, with its hard subsoil and surplus water. Trees can be planted here with success from the first day of October until the first day of June, whenever there is no frost in the air or in the earth. In Illinois, trees planted at any time but in the spring will heave out and be destroyed quite frequently. Our air here is rather dry, but appears to be becoming more humid with the cultivation of the land. Our losses are not one-fourth from drouth that there would be from heaving in Illinois and Iowa, where trees have been well cultivated. This is a substantial fact. Almost any trees that will succeed in Illinois will do so here, on bottom or level lands. On upland, trees grow dwarfed and begin to seed when five or six feet high, because of the hard clay subsoil, which is dry because the buffalo grass sheds the falling rain like a roof. When the land is under cultivation the water will go down and soften the clay, when trees will grow with more thrift, as the tap-roots can strike deeply. I have observed that forest trees do best when planted close, as they shade the ground quickly and keep down weeds; grow upright and straight; retain the leaves as a mulch; are a protection to themselves from drying winds; hold the snow, and establish a forest condition, and hence will grow more thriftily. Nature establishes forests by planting thickly, and thins by the "survival of the fittest." Let us follow her teachings. I believe a grove planted with 10,000 seedlings to the acre will be profitable, while I doubt very much if 2,000 would be, as the conditions are exactly the opposite of what I have said above, if we plant thin, or like an orchard.

Most of the timber plantations in the county are only efforts to secure the land under the "timber-culture act," and just enough trees are planted to secure the object, which is all the planters care for. Amelioration of the climate and future general benefit to the country are not considered. Hence 90 per cent. are miserable, abortive attempts and failures. Poverty, lack of knowledge, and shiftlessness only make tree culture a failure here. Not that trees "won't grow"—I know they *will*. Perhaps the fostering care of State legislation would give the people more encouragement.

As far as I have observed of evergreens, the Scotch and Austrian Pines and Red Cedar succeed well here, and will do for popular and economic planting. They grow rapidly, will thrive in the most exposed situations, and form an impenetrable wind-

break. Hundreds of farmers in Iowa have wind-breaks around their houses, barns and stockyards. They find that *growing* pine trees are cheaper than *decaying* pine lumber. Nearly all kinds of fancy evergreens and shrubbery can be grown here by skillful and intelligent management, if they are properly sheltered.

## LIST OF RECOMMENDED FOREST TREES.

BY THE SECRETARY.

The following varieties of forest trees are recommended for cultivation in Kansas. Each list here given is classified as to texture and durability of the wood, and in the order of comparative value:

**SOFT WOOD CLASS.**—Ash-leaved Maple (Box Elder), Cottonwood, Elm, red, Linden (Basswood), Maple, white, Sycamore, Willow.

**HARD WOOD CLASS.**—Ailantus, Ash, Black Locust, Black Walnut, Catalpa, Cherry, wild, Elm, white, Hackberry, Kentucky Coffee Tree, Maple, sugar, Mulberry, Pecan Nut.

**VERY HARD WOOD CLASS.**—Hickory, Honey Locust, Osage Orange, Oak, white, Oak, burr.

**DURABILITY OF WOOD.**—The Catalpa, Osage Orange, and Oaks—white and burr—are most durable when exposed to atmosphere, or buried in the ground. Ailantus, Black Walnut, Honey Locust, Black Locust, Mulberry, Ash, Cherry, Sugar Maple, and Elms are durable in dry places, and are desirable woods for inside finishing, and the manufacture of many kinds of implements which are housed in bad weather.

Most of the other classes decay rapidly when exposed to rains and sun, and possess few valuable properties for other purposes than fuel and temporary constructions.

In their adaptability to locations and soils, all except the Ailantus succeed best on low and bottom lands. The Ailantus is hardy, and produces the best results on gravelly uplands. But there are others in the list which thrive satisfactorily on uplands and resist the injurious effects of drouth, and can be relied on when planted in such locations. Such are the Honey Locust, Osage Orange, Catalpa, Hackberry, and White Elm.

The most valuable varieties for their wood are Black Walnut, Catalpa, Osage Orange, Wild Cherry, Hickory, Oaks—white and burr—Ash, Ailantus.

**INSECT ATTACKS.**—The Honey Locust, Osage Orange, Catalpa, and Black Walnut are the least liable to, in fact almost entirely exempt from, any damaging species. Most of the soft-wood class, and the Ash, Elms, Hackberry, Black Locust, and Oaks of the hard class, are some seasons quite seriously injured by the attack of flat-headed species of tree borers; but this usually occurs during the prevalence of dry weather, and more frequently during the year of planting, and a low vitality in the tree, caused by poor condition of tree and late planting, or neglect in culture, as well as from a drouth. This can be largely averted by using seeds, or trees not more than one year old, and by constantly stimulating the growth by frequent cultivation.

## FORESTRY, BY COUNTIES.

The following county reports have been compiled from answers to Circular No. 2, for 1884, as follows:

SECRETARY'S OFFICE, KANSAS STATE HORTICULTURAL SOCIETY, }  
LAWRENCE, KANSAS, November 10, 1884. }

DEAR SIR: Permit me to kindly ask your careful attention to the questions contained in this circular, which are intended to collect such information relating to the forestry interest as will be valuable as a guide to planters in Kansas, and especially to those who are settling upon the Western prairies and attempting to improve such lands for their future homes. In your answers please consider the questions from a practical point, based on experience of your own, or the observations of others who are practical men and engaged in such work to such an extent as to enable them to impart the knowledge herein desired.

## QUESTIONS.

1. Has the planting of forest trees in groves, belts and timber lots been a success in 1884?
  2. What varieties of trees have been most extensively used? (1) For groves. (2) For belts or shelters. (3) For timber lots.
  3. What system of planting has been most successful?
  4. What distances in rows have proven preferable?
  5. What system of culture has given the most satisfactory results?
  6. What, in your opinion, have been the causes of failures, if any?
  7. Do you recommend seed planting, or young trees, on the ground where they are to stand permanently?
  8. If seed, what is the best preparation and after-management?
  9. If young trees, what the best age to use, and what preparation do you give them for planting?
  10. If both seeds and young trees, please state the varieties to be used in each class. (1) Seeds. (2) Young trees.
  11. Please arrange the following list in the order of preference, based on experience and observation, as to their comparative value for general purposes, ready adaptation to climate and soil, and successful growth: (1) Black Walnut; (2) Catalpa—Western Hardy; (3) Honey Locust; (4) White Ash; (5) Green Ash; (6) Box Elder; (7) Osage; (8) Cottonwood; (9) White Elm; (10) Red Elm; (11) White Maple; (12) Black Locust.
  12. If any are objectionable, please erase and substitute others preferable, if any, stating the objections.
  13. Please classify the list into two classes, as best adapted (1) to uplands; (2) to lowlands.
  14. What has proven the best culture for (1) upland plantations; (2) lowland plantations.
  15. Do you recommend fall or spring planting of seeds maturing in autumn?
  16. If spring, what is the best method of preservation over the winter?
  17. Do you recommend fall or spring planting for young trees?
  18. Insects: Are they prevalent and seriously damaging to any of the varieties of forest trees? If so, which, and in what manner?
  19. What means are used for prevention?
  20. Are rabbits troublesome? If so, what means are successfully used to protect the trees?
  21. Is the area of forest-tree plantations being annually extended?
  22. Do you discover a tendency to early decay of trees planted (1) on uplands? If so, state which varieties, and the age at which decay becomes apparent. (2) On lowlands.
  23. Do shelter-belts prove an advantage to your fruit grounds? If so, in what way?
  24. Do shelter-belts prove an advantage to general field crops? If so, in what way?
- Please give this circular your careful attention, and return your answer to this office by December 10, 1884.

Very truly, etc.,

G. C. BRACKETT, Secretary.

## ATCHISON COUNTY.—BY HARVEY L. BROWN, IVERMAY.

The planting of forest trees in groves and timber lots has been a success, and the wood-growth in 1884 was remarkably fine and vigorous. White Maple, Ash-leaved Maple, Walnut, Osage Orange and Cottonwood have been most extensively used in planting for timber lots; while the White Maple, Ash-leaved Maple and Osage Orange

are preferred for shelter-belts. The system of planting in rows four feet apart, and removing or thinning them out as the development with age requires, and cultivation each year similar to that needed to produce a crop of corn, has proven to be the best. Seeds may be successfully used in the construction of belts or timber lots, though young trees or seedlings are equally as successful. For seeds the land should be thoroughly prepared by deep plowing and harrowing, and the young plants kept free of weeds by good culture. When trees are to be used, one and two-year-olds are preferable. The roots should be kept moist from the time they are taken up, and planted when the land is in proper condition. The following list is recommended, and is arranged in the order of comparative value for general purposes, ready adaptation to climate and soil, and successful growth: Black Walnut, Honey Locust, Ash-leaved Maple, Osage Orange, Cottonwood, White Elm, Red Elm, White Maple, Catalpa—Western Hardy. The last named has not been planted extensively, therefore not fully tested. The Black Locust is ruined by the attacks of borers. For uplands, the Catalpa, Honey Locust, Ash-leaved Maple, Osage Orange, Cottonwood, White Elm, Red Elm and White Maple are most suitable. For lowlands, the Walnut, White Ash, Green Ash and Cottonwood afford the best results. In either location success depends largely on good cultivation. Spring is the safest time in which to plant young trees, or seeds, as seeds when planted in the fall are liable to be destroyed by mice and other pests. Of pests, caterpillars destroy the leaves of the White Maple, and borers riddle the Black Locust; but the most injury done to forest trees while young is by rabbits. The area of artificially-grown forest trees is not extensive in the county, but all such plantations are healthy and vigorous, and there are no indications of any early decay, on either the lowlands or uplands. Shelter-belts have proven a great advantage to the fruit and field crops, in destroying the force of violent winds, and tempering their cold effects.

BARTON COUNTY.—BY JOSEPH GAULT, HUGH A. WILSON, GREAT BEND; JOHN F. DOYLE, NATHAN.

Forest trees have always been a success wherever properly planted, and cared for after planted. Cottonwood, Ash-leaved Maple and Black Walnut are most successfully used for groves; Cottonwood, Black Walnut, Osage Orange and Willow for shelter-belts; a few planters are using the Honey Locust. For timber lots, Cottonwood, Ash-leaved Maple, Black Walnut, Ash and Honey Locust. Seeds, as a rule, are preferable to young trees in planting. Drop two or three in a place, and when the young plants are three or four inches in height, thin out to a single plant. But young trees, not over a year old, are used successfully. Care must be given to keep the roots moist by dipping them in the mud, and the ground firmly packed around them when set. If young trees are to be used, the Ash-leaved Maple, Osage Orange, Cottonwood, White Elm and Hackberry are the easiest and safest in transplanting. List recommended, and arranged in the order of comparative value for general purposes, ready adaptation to climate and soil, and successful growth: 1, Black Walnut; 2, White Ash; 3, Red Elm, Catalpa, Ash-leaved Maple; 4, Osage Orange; 5, Cottonwood; 6, Ash-leaved Maple, Honey Locust, White Ash; 7, Green Ash, White Maple, Catalpa; 8, White Maple, White Ash, Hackberry; 9, Osage Orange, Green Ash, White Elm; 10, White Elm, Black Locust, Red Elm; 11, Honey Locust, White Elm; 12, Catalpa, Red Elm.

[NOTE.—Where more than one variety is mentioned in connection with the number in the order, they are the recommendation of the reporter, corresponding with the order of their names at the heading.—SECRETARY.]

For planting on uplands, Black Walnut, Honey Locust, Ash-leaved Maple, Osage Orange; for lowlands, add to the foregoing Cottonwood, White Ash, Catalpa, Hackberry, White Elm, and Red Elm. But all varieties succeed best on the lowlands. All kinds of seeds which require freezing should be planted in the fall, or as soon as ripened; others

may be kept through the winter, mixed with moist sand, and stored in a cellar. Ash-leaved Maple and White Ash placed in a cool, dry cellar maintain their vitality until planting-time in the spring. The planting of young trees is the most successful when done in spring-time. Of insects, there are none which seriously injure forest trees excepting a borer which attacks the White Ash. Ground squirrels are quite destructive to seeds planted in spring. To prevent this, nuts are coated with tar and then rolled in ashes, or for easy handling may be rolled in sand. Rabbits are quite injurious to young Catalpa and White Ash trees. This may be prevented by coating the trees with some kind of wash offensive to them. The area of forest-tree planting is annually extending. There are some complaints of a tendency to decay among such as are planted on uplands, but by some of the most experienced planters it is believed to be the result of neglect. Shelter-belts are a great advantage to fruit grounds. Trees make a straighter growth and form a more evenly shaped head, and the bloom and fruit are preserved by such protection from violent southwest winds. They have also proven to be advantageous in protecting the field crops from the withering hot south winds.

BROWN COUNTY.—BY R. C. CHASE, HIAWATHA.

Forest-tree planting, wherever done properly, was a success in 1884. The Catalpa, Honey Locust, Black Walnut, Green Ash, Ash-leaved Maple, Osage Orange and Cottonwood were used most extensively for groves; Honey Locust, Ash-leaved Maple, Black Walnut and Osage Orange for shelter-belts; and Black Walnut and Catalpa for timber lots. The cultivation should be the same as a thrifty farmer would give his corn, until the trees are four or five years old, when they will take care of themselves, if protected from cattle and fire. Of most sorts I would recommend using young, not over one-year-old trees, cutting them back to near the collar at planting-time. This will insure a certain growth and straight body. The Black Walnut should be started with seed, as it does not bear transplanting well. The following list of varieties is recommended as well adapted to our climate and soil, and preferred in the order named: Black Walnut, Catalpa (Western Hardy), Honey Locust, White Ash, Green Ash, Box Elder, Osage, Cottonwood, White Elm, Red Elm, White Maple, Russian Mulberry. The Black Locust is objectionable, because of the injury done by borers. For uplands, Catalpa, White Ash, Osage Orange and Honey Locust are preferable; for lowlands, Black Walnut, White Elm, Red Elm, Green Ash, Ash-leaved Maple, and Cottonwood. Spring-time is preferable for planting either seeds or young trees. Insects have been prevalent, and mostly of borers, which attack Black Locust and Ash-leaved Maple. Rabbits are troublesome. Shooting and trapping are the only means used in attempting to exterminate them. I have not discovered any tendency in forest trees to early decay. Shelter-belts are an advantage to fruit grounds and field crops, by the protection they afford from winds, both in summer and winter.

BUTLER COUNTY.—BY W. H. LITSON, BENTON; HARVEY FENTON, INDIANOLA; AND E. C. RICE, AUGUSTA.

Forest-tree planting in some portions of the county was not a success in 1884. Cottonwood, Black Walnut, Hardy Catalpa, White Maple and Russian Mulberry have been the most extensively used for the construction of groves; Cottonwood, Ash-leaved Maple, Lombardy Poplar and Peach trees for shelter-belts; and Locust, Ash, Mulberry, Catalpa and Black Walnut (with Cottonwood for nurse trees) for timber lots. There has been no reason for changing the system of planting and managing forest-tree plantations which was adopted years ago, viz.: close planting, good cultivation each year, and thinning out at proper time, or when the growth begins to interfere. Neglect has been the main cause of failures. The experience of the past teaches that it is the



cheapest and most practicable method to plant the seed in nursery form and transplant the trees at one-year-old. In all cases land to be used for timber plantations should be well prepared, and the young trees receive good cultivation during the growing season. The following list succeeds, and is recommended to planters in the order of comparative value for general purposes: Black Walnut, Cottonwood, Catalpa, Honey Locust, Osage Orange, Red Elm, White Maple. In some localities White Ash, Green Ash, Ash-leaved Maple and Black Locust are a success. The following list is best adapted to upland: Cottonwood, Catalpa, Osage Orange, Mulberry, Black Locust. For lowlands: Black Walnut, Elm, Catalpa, Osage Orange. Spring-time is preferable for planting either seeds or young trees. Seeds of most classes can be safely preserved through winter by storage in a dry cellar. Insects: The fall web-worm has been prevalent, destroying the leaves of Black Walnut and Cottonwood trees, and the flat-headed borer seriously injures the Ash-leaved and White Maples. The former pest can be suppressed by hand-picking and killing; and as a protection from the latter, keep up a vigorous growth of the tree by thorough cultivation. Rabbits have been very annoying, and do a great amount of injury in forest-tree plantations. Washing the bodies of trees with some kind of an offensive solution not injurious to the trees affords a good protection. The plantations in the county, though not extensive, are generally healthy; failures generally caused where neglect prevails. Opinions as to the advantages of shelter-belts to growing crops vary. Some planters are strong in the belief that they are a necessity, while others assert that they are of no apparent advantage.

CLAY COUNTY.—BY A. R. KEELER AND D. S. CHAPMAN, CLAY CENTER.

Forest-tree planting was a success in 1884. Varieties used the most extensively: Cottonwood, Ash-leaved Maple, White Maple, Black Walnut and White Ash for groves; Cottonwood, Ash-leaved Maple, White Maple and a native Willow for shelter-belts; Cottonwood, Black Walnut, White Ash and Honey Locust for timber lots. It is as essential to success in this, as for any crop, that land to be used for trees should be thoroughly prepared before planting. As a general rule, it is best to plant all classes of seeds as soon as ripened, and the covering of earth should be governed by the character of the seed used. Light seeds should be covered lightly, or the minute plant would fail to force itself above ground, hence would perish. For all such, half an inch of covering will do. Those having stronger growth, hence more force, will bear an inch or two of covering. The planter must use his judgment with the different forms in seeds. It is a matter of convenience and economy to plant seeds of most of the sorts in nursery form. They can be more easily cared for in cultivation and protection. The nut seeds should be planted in rows where they are to form into permanent trees. The others to be transplanted to rows at one-year old. Planters differ as to proper distance at which to plant. But eight feet apart in rows for all kinds except the Cottonwood, which should be twelve feet, affords easy culture at least; and the Willow four feet. Thorough culture each year, until trees are sufficiently large to shade the ground between the rows, is advisable. A neglect of such treatment generally results in a failure of the undertaking to grow a forest. All classes make a healthy growth, planted on either uplands or lowlands, if properly cared for, though the Cottonwood and Black Walnut thrive the best when planted on lowlands. As to the time for planting, it is generally conceded that seeds should be planted as soon as ripened, and young trees in the spring. The area of forest-tree planting is being generally extended. No tendency to early decay has been noticed, except in cases where the planting has been too close, and then mostly among Cottonwood trees. These evidently require a greater distance—at least twelve feet, than other kinds. Shelter-belts are an advantage to orchards by affording protection to the fruit, which would, in exposed locations, be blown off by the southwest winds, which are common during the fruiting period, and the cold "northers" during the winter.

## CHEROKEE COUNTY.—BY JARED P. ATKINSON, CRESTLINE.

Very few forest trees were planted the past season. Those which were planted in past years made a fine growth. The varieties most extensively used for groves were White Maple, Black Walnut and Elms, and recently quite a number of Catalpas. For belts or shelters, the same varieties as above stated, with the addition of Hard Maple and some of the hardy evergreens. All of the foregoing are adapted to timber-*lot* planting. The system prevails of close planting in rows four feet apart each way for spreading sorts, and eight or ten feet for other sorts. Mulch or thoroughly cultivate between has proven the most successful. Black Walnut trees should be started by planting the seed where it will form into a permanent tree, as they do not transplant successfully. Of other sorts, young trees one or two years old are preferable. The following list are recommended in the order of their comparative value for general purposes, ready adaptation to climate and soil, and successful growth: Black Walnut, Catalpa (Western Hardy), White Elm, Red Elm, White Maple, Cottonwood. For uplands, Catalpa; lowlands, Black Walnut, White Maple, Hard Maple, Red Elm, White Elm, and Cottonwood. All varieties named above succeed on either upland or lowland, but best on lowlands. Those planted on uplands thrive best when mulched after the first of July, while such treatment is not necessary on the lowlands. Seed planting affords the best results done in the fall, or as soon as they ripen. They can be preserved until spring by packing in sand. When young trees are to be used, spring-time for their planting should be selected. Insects: None trouble forest trees in the county, except borers in the White Maple, and some leaf-eaters. Rabbits are very annoying, and there is no better prevention than their destruction with dog and gun. None of the varieties of trees named show any tendency to premature decay except the White Maple, which begins decaying when about four or five years old. Should they pass that period, they generally live on to a good age, and attain to a large size. Shelter-belts are an advantage to fruit grounds and field crops in protection from the violent winds, which often blow off the fruit and lay the growing grain flat on the ground.

## CLOUD COUNTY.—BY C. H. SHEFFIELD, DELPHOS.

Forest-tree planting was successful in 1884. The varieties of trees most extensively planted were Ash-leaved Maple, Black Walnut and Ash for groves; Cottonwood, Ash-leaved Maple and Ash for shelter-belts; Black Walnut, Ash, Osage Orange and Catalpa for timber-lots. The system generally adopted, of planting in rows four feet apart each way, followed by clean culture, has proven successful. Seeds of all nut-bearing trees should be planted in autumn where they are to form the future tree; and all tree seeds should be planted at the time in which they have ripened. If grown in nursery form it is desirable to transplant at one year old to permanent plantations, and in spring-time. List of varieties, recommended in the order of preference as to their comparative value for general purposes, ready adaptation to climate and soil, and successful growth: Black Walnut, Catalpa (Western Hardy), Honey Locust, White Ash, Green Ash, Ash-leaved Maple, Osage Orange, Cottonwood, White Elm, Red Elm, White Maple. The following are adapted to uplands: Black Walnut, Ash-leaved Maple, Honey Locust, Osage Orange, Catalpa; to lowlands, Cottonwood, Black Walnut, Ash, Elm, Catalpa. Insects: A species new in this county attacked the Ash-leaved Maple. It resembled the tent caterpillar, but much brighter in color, being an ashen gray. Borers were quite damaging to the above trees and the Black Locust. The area of forest-tree planting is being annually extended, and no evidences of an early decay have been noticed among any kinds other than the Cottonwood. Timber-belts or shelters have been a great advantage as a protection to our fruit grounds and fields of grain, and the planting of such shelters should receive the encouragement of every person interested in the success of tillers of our soil.

COWLEY COUNTY.—By J. F. MARTIN, R. J. HOGUE, WINFIELD; H. TODD, CAMBRIDGE.

Forest-tree planting was successful in 1884. The varieties which were most extensively planted were as follows: Catalpa, White Maple, Cottonwood, Black Walnut, Elm, Mulberry, Hackberry and Red Cedar for groves; Cottonwood, Catalpa, White Maple, Black Walnut and Poplar for belts, or shelters; and all of the foregoing for timber lots, with the addition of Hickory, Oak, Cherry, Linden, and Kentucky Coffee-Tree. These have been planted about four feet apart each way, which seems to be the proper distance, and with thorough cultivation have been a success. Wherever failures have occurred they are mostly traced to neglect of the above-named methods. Seeds of nut-bearing classes should be planted where the trees are to be grown, and all seeds do best if planted at the season of their ripening. If young trees are to be used, one and two years old are preferable, and should be set in early spring, in well-prepared land. The following list is recommended in the order of preference for general purposes, adaptation to climate and soil, and successful growth: 1, Black Walnut; 2, Catalpa; 3, White Maple, White Ash, Linden; 4, White Ash, White Maple; 5, Wild Cherry, Osage Orange; 6, Osage Orange, Red Elm, Ash-leaved Maple; 7, Red Elm, Honey Locust, Osage Orange; 8, Cottonwood, Green Ash, Cottonwood. Lists adapted to uplands and lowlands are similar. Black Walnut, Maples, Catalpa, Elms, Ash and Cottonwood grow most vigorous on lowlands. Trees on uplands are much more vigorous when well manured. Shelter-belts, or wind-breaks, are important helps in protecting orchards and fields of grain. There is sufficient evidence in the improved condition of plants and trees, and the increased product, when grown under their protection.

CRAWFORD COUNTY.—By G. W. MOSTELLER, GIRARD.

The plant of forest trees in 1884 was a success. Catalpa, Walnut, Ash-leaved Maple, Honey Locust, Oaks, Osage Orange, Ash, Russian Mulberry and Cottonwood have been most extensively used for groves. Catalpa, Osage Orange, Russian Mulberry, Walnut, Honey Locust, Elms and Cottonwood for belts or shelters, and Catalpa, Walnut, Ash, Russian Mulberry and Cottonwood for timber lots. The best success has been obtained by planting in rows four by four or four by six feet apart, as close planting tends to encourage an upright and straight growth. For belts, would advise planting only two rows, six feet apart and ten feet alternately in the row. As most of the soil in this county is a tough clay loam, underlaid with a stratum resisting saturation by water, thorough culture is best. On the dry soils a thorough mulching adds much to success, and as a large portion of the failures in tree planting are due to a neglect of proper cultivation, mulching is generally recommended. The system of planting rows of White Maple or Cottonwood trees among plantations of other and slower growing sorts as nurse trees meets with favor among our intelligent planters. Using one-year-old trees is a matter of economy both in the purchasing and in the expense of labor in setting, as every experienced tree planter is aware of the difference in the expense between small and large-sized trees. List recommended for general purposes, ready adaptation to climate and soil, and successful growth, arranged in the order of preference: Catalpa, Black Walnut, White Ash, Osage Orange, Honey Locust, Green Ash, Cottonwood, Red Elm, Black Locust, White Elm, Ailantus, Oaks. I would add Red Cedar to the foregoing list as promising to become one of the safest and most valuable sorts for Kansas. It makes an annual growth from two to three feet, transplants easily, forms a beautiful ornamental tree, and affords a valuable wood for many useful purposes. The above list is well adapted to either upland or lowland. Young trees can now be bought so cheap that they are within the reach of even planters of small means. It is advisable to plant all kinds of forest-tree seeds as soon as ripened, but if not convenient, the Walnut, Locust, Oak and Red Cedar can be safely carried through the winter if buried in ground which is well drained,

or mixed with moist sand. Fall planting of young trees is followed by a better growth the following season than when set out in the spring; yet spring planting is successful. Evergreens should invariably be set in spring, as they seldom survive our winters if planted in the fall. Insects: Maple trees are defoliated some seasons by the maple-worm, are also attacked by a borer, as are the Elms and Black Walnut. Rabbits are troublesome to forest-tree plantations, and no means have proven an absolute prevention. Dogs, guns in the hands of expert boys, traps and strychnine are the most effectual agencies to suppress them. The area of forest-tree planting is rapidly increasing. Railroad companies and the farmers are planting about thirty thousand Catalpa trees each year. None of the kinds mentioned show any tendency to a premature decay, except the White Maple and Ash-leaved Maple. The former seldom survives after reaching the fifth year. Of the latter, seldom is a healthy tree found which has attained to more than eight inches in circumference. Wind-breaks or tree shelters are an advantage to the orchard and to field crops, by modifying the force of winds, which prevents orchard trees being swung to and fro and shaking off the fruit, and in them are furnished every encouragement for birds to abide while engaged in the rearing of their young and the capturing of many unfriendly insects while preying upon the orchard or its fruit. Field crops are also thus protected from the sweeping winds, where otherwise they would be seriously injured. Such shelters should be constructed on all sides of inclosures excepting the eastern.

DAVIS COUNTY.—BY WM. CUTTER, JUNCTION CITY, AND N. TRAFTON, MILFORD.

Success attended the planting of artificial forests in 1884. The following kinds were most extensively used for groves: Black Walnut, Maple, Ash-leaved Maple, Catalpa, Honey Locust, Cottonwood; for belts or shelters, the same as for groves, adding thereto the Peach tree. For timber lots: Black Walnut, Cottonwood, White Maple, and Catalpa. The system of planting in rows, four feet by eight or ten, has been practiced with satisfactory results. Some planters adopt the system of alternation of trees in the rows, which tends to strengthen the resistance to violent winds, and would be quite an advantage to the upright forming and securing a straight body. Seeds of nut-bearing sorts should be planted where the tree is to be grown. But of all other sorts it is best to plant in nursery rows, cultivate one year, then transplant to permanent locations, and where the land has been thoroughly prepared by deep plowing and well harrowed. Recommended list of varieties which are adapted to climate and soil, and afford a satisfactory growth: 1, Black Walnut; 2, Catalpa, western hardy; 3, Honey Locust, Cottonwood, White Maple; 4, White Ash, Green Ash, Osage Orange; 5, White Maple, Ash-leaved Maple; 6, Osage Orange, Red Elm; 7, Cottonwood, Osage Orange; 8, White Elm; 9, Red Elm, Honey Locust; 10, Green Ash, Black Locust. For uplands, the Black Walnut, White Maple, Ash-leaved Maple, Catalpa, Osage Orange. For lowlands, Cottonwood, Red Elm, White Elm, Honey Locust, Ash, Osage Orange. Seeds should be planted as soon as ripened, and young trees transplanted in the spring. Seeds, excepting the early-ripening classes, may be preserved until time for planting in spring, by being placed in a cool cellar, protected from mice and liability of attacks of mould. Insects: All kinds of trees excepting the Black Walnut, Catalpa, and Honey Locust, are liable to the attacks of borers. Rabbits are the most annoying pests which forest-tree planters have to contend with. The means of protection are traps, and hunting them with dogs, or any way to successfully exterminate them. The area of forests artificially planted is annually increasing. There is not a tendency to early decay, excepting with the Cottonwood when planted on thin soil. Failures in planting are mainly due to carelessness and neglect, and will occur in either uplands or lowlands. The advantage of a shelter-belt near the orchard is yet in doubt. Some orchardists are quite firm in the

belief that the protection afforded is essential to the success of their crops of fruit; while others not only believe they are useless, but that the shelter which they give is a detriment, in that they cause a stagnation of air within the inclosure, resulting in a liability of frost in spring and attacks of fungi on the fruit, causing the well-known disease called "scab" on apples, peaches and pears.

DICKINSON COUNTY.—By PROF. J. W. ROBSON, CHREVER, AND E. EICHHOLTZ, DETROIT.

Success attended the planting of forest trees in this county in 1884. Cottonwood, Ash-leaved Maple, Catalpa (Western Hardy), Walnut, White Maple, Ash, Russian Mulberry, Honey Locust, Kentucky Coffee Tree, Black Locust, Elm, Native Mulberry, and Hackberry, have been most extensively used for groves; Cottonwood, Maple, Catalpa, Ash-leaved Maple and Russian Mulberry for belts or shelters; Black Walnut, Catalpa, Maple, Russian Mulberry, Oaks and Kentucky Coffee Tree for timber lots. The close-planting system has been generally adopted, and is successful, viz.: in rows four feet by four, using one-year-old trees of all classes excepting the nut-bearing sorts, which do best where the seeds are planted in rows forming the future forest or timber lot. The above-named thick planting affords the advantage in shelter-belts of increasing their density, hence a more complete barrier to winds, and in timber lots encourages a straight, upright growth; also, sooner develops a shade of the ground, a condition more congenial to the existence and rapid growth of forest trees. Most cases of failure are attributable to neglect of a proper mode of planting and thorough cultivation. It is a matter of economy to plant all classes of forest-tree seeds, excepting those above named (the nut-bearing kinds), in nursery form, and transplanting when one year old. Being in rows three or four feet apart, most of the cultivation can be done by horsepower, and can be the more easily protected from insects and rabbits. The early-ripening kinds of seeds, as Maple and Cottonwood, should be planted as soon as cast off by the parent tree, and will frequently make from one to two feet of growth the same season. Later-ripening sorts can be kept over until spring packed in sand and placed in a cool, dry cellar, to prevent the attack of mould. The following list is recommended as valuable for general purposes, ready adaptation to climate and soil, and affording a satisfactory growth: Black Walnut, Catalpa (Western Hardy), Honey Locust, White Ash, Green Ash, Ash-leaved Maple, Osage Orange, White Elm, Red Elm, White Maple. For upland planting, Russian Mulberry, Black Walnut, Oaks, Kentucky Coffee Tree, Maples, Elms, Locust (black and honey); and the evergreens, Norway Spruce, Red Cedar, Scotch Pine, Black Austrian Pine. For lowlands: Russian Mulberry, Cottonwood, Black Walnut, Kentucky Coffee Tree, Ash-leaved Maple, Elms, and all the evergreens named for uplands. Autumn is preferable for planting all classes of seeds and spring for transplanting of young trees, although success has been realized from fall planting. Insects: Borers attack the Maples and Cottonwood. Suggested remedy: Plant only such kinds of trees as are not liable to the attacks of these pests. The area of forest-tree planting is being annually increased. No evidence of an early decay has been noticed of any sorts excepting the Maples and Cottonwood, either on upland or lowland. Shelter-belts formed on the north, west and south are an advantage to orchards, and should be located at least twelve rods from the first orchard row. Scotch and Black Austrian Pines are preferable for such purposes.

ELK COUNTY.—By D. C. HARKNESS, HOWARD.

All forest trees planted in 1884, and properly taken care of, were a success. The Catalpa, Black Walnut and White Maple were most extensively used for groves, shelter-belts and timber lots. The system adopted—viz., planting in rows four feet apart each way, thorough cultivation with plow and hoe—affords satisfactory results. The failures

are mainly due to neglect, and using old trees. One-year-old trees are preferable, and may be easily and cheaply grown from seed in nursery form. They should be dug up in the fall, and heeled in, root and top, until spring. Plant as early as practicable. Land to be used for such purposes is much improved by heavy manuring before planting. The area of forests artificially planted is annually increasing; about one-fourth is destroyed each year by rabbits, which are the main hindrance to a more rapid extension. Shelter-belts are an advantage to orchards, in affording them protection from violent winds, which withe and break the branches and bruise the fruit.

ELLIS COUNTY.—BY M. ALLEN, HAYS CITY.

The forest-tree planting in 1884 was a success in this county. Cottonwood, Ash-leaved Maple, Green Ash, Black Walnut, Honey Locust and Osage Orange were most extensively used for groves, shelter-belts and timber lots. The system which has proven the most satisfactory is that of planting in rows, eight to twelve feet apart and about four feet in the row, so that easy cultivation may be given each way. The culture should be persistently continued, and thoroughly done—keeping down all weeds by plowing, hoeing, or running of a cultivator. The causes of failures are mainly a bad condition of trees at the time of planting; sorts non-adapted to soil and climate; neglect in their cultivation. Young or one-year-old trees are preferable in setting a timber lot, except it may be the Black Walnut, the nuts of which should be planted in rows where the tree is to remain. It has been suggested that it would be best to plant these nuts thickly in rows, say 36, 48 or 60 feet apart, cultivate one year, then fill up the intermediate spaces with rows formed with the yearling trees from the seed rows. Seeds should be planted in deep rich land which has been well prepared. Land which has never been cropped, but is new and free from weeds, is preferable. Foul land should be avoided. In using young trees, care must be given to protect their roots from drying by exposure. To best secure this, dip the roots in mud until they are well coated, and keep moist until planted. List recommended of forest trees which are adapted to climate and soil, and afford a satisfactory growth: Honey Locust, Black Locust, Ailantus, Wild Cherry, Hackberry, Green Ash, Osage Orange, Black Walnut, Catalpa (Western Hardy). List best adapted to uplands, Honey Locust, Black Locust, Ailantus, and Hackberry. These succeed in comparatively thin and dry land. To low lands, Wild Cherry, Green Ash, Osage Orange, Black Walnut, Cottonwood. These require good rich land, be it on high or low lands. Seeds do the best when planted in the fall, but nuts may be safely preserved until time for planting in spring by packing in spent saw-dust, sand or earth, and placed where they will freeze. Seeds proper do not need any special preparation only to be kept cool and dry enough to prevent mould attacks. Young trees: Transplant in spring as soon as land can be properly worked. Insects: The Green Ash is some years defoliated by a large green worm resembling the tobacco or tomato worm; also is attacked by a borer. Rabbits undisturbed accomplish serious damage. Trees can be protected from their depredations by smearing the body with blood or animal excrement. An old cat with kittens will often kill young rabbits in great numbers; and an English shepherd dog by a little training will usually keep them so stirred up that they do but little damage. Have not discovered any tendency to early decay among forest trees, either on upland or lowland, excepting the Cottonwood groves, and such are confined to uplands. Shelter-belts have proven to be an advantage to fruit plantations, especially when constructed on the south side, the direction of the drying winds in summer; and by holding the drifting snows, which furnish a surplus of water by melting in spring and saturating the subsoil, which will furnish future moisture to plants. These advantages also apply to benefit the growing grain crops.

ELLSWORTH COUNTY.—By C. L. MYERS, ELLSWORTH, AND F. J. SWEHLA, WILSON.

Forest-tree planting in groves, belts and timber lots was eminently successful in 1884, both on upland and lowland. The following kinds have been most extensively used for groves: Osage Orange, Black Locust, Honey Locust, Maple, Mulberry, Catalpa, Ailantus, Ash-leaved Maple, and some Cottonwood. Honey Locust is leading all others, but the Yellow or Black Locust excels in rapidity of growth and longevity. The Russian Mulberry is fast gaining in favor among tree-planters in this county, and may be added to the above list for timber. The question of a proper distance at which to plant is not fully settled. Some planters set four feet apart each way, while others set in rows eight feet apart and two feet in the row. There should be ample space between the rows one way to easily cultivate. During the first three years this can be done with a two-horse cultivator, but thereafter can be done, without injury to the trees, by using a one-horse turning-plow. First in the spring turn the earth from the rows, and as soon as the weeds which are covered are rotted, then turn the earth back toward the rows. All cultivation should cease by the middle of July in each season. The main causes of failures is injudicious management, as cultivating too late or neglecting to cultivate, non-adaptation of kinds used, mutilation of the roots while working the ground. Young trees (yearlings) are preferable to seed or any other age. Before they are set, cut back the top to within four to six inches of the collar and plant them a couple of inches deeper than before they were taken up. All seeds, except nut, do best when planted thick in nursery form and then grown until one year old. The following list is most valuable, and is arranged in the order of preference: Honey Locust, Black Locust, Black Walnut, Catalpa, Osage Orange, Mulberry, White Ash, Green Ash, Ailantus, White Maple, White Elm, Ash-leaved Maple, Cottonwood. Objections: The Walnut is a slow grower. Cottonwood, Maple, White Elm and Red Elm require moist land, such as occurs along the watercourses; hence are not well suited to dry uplands. To classify the list as suited to uplands, would name Honey Locust, Black Locust, Black Walnut, Catalpa, Osage Orange, Mulberry, and Ailantus; for lowlands, all of the above except Ailantus. The Cottonwood, Ash-leaved Maple, White Maple and Elms do best on lowlands. The system practiced by some planters, viz., to cut back to the ground all crooked, ill-shaped trees, is a good one, as the young shoot will make a vigorous, straight growth, from which will form a nice tree. Autumn is a preferred time to plant seeds, and spring for young trees, though some are planted in the fall if the land is not rendered unfit by a spell of dry weather. Insects: Cut-worms destroy young plants, grasshoppers are sometimes annoying, and the Colorado potato bug feeds on the young and tender plants of the Honey Locust. For the first time, a borer was found working in the Ash this year. The area of artificially-planted forests is gradually increasing. There are indications of premature decay found only among Cottonwood, Ash-leaved Maple, but it is noticeable only on dry uplands. Some cases of failure are found among the native Mulberry. Shelter-belts on the south side of orchards and fields of grain are an advantage. All classes of fruit trees make a better growth and yield better crops of fruit, and especially is this true of peach trees, where there is a shelter either natural or artificial.

FORD COUNTY.—By JAS. NICOLL, SPEAREVILLE.

(*North half.*)

All classes of forest trees made a more favorable growth than for the six previous years. The Cottonwood, Black Walnut and Honey Locust were most commonly used in 1884, and were planted in rows four feet apart. The following varieties are recommended to planters in this section of the State, and preferred in the order named: Catalpa (Western Hardy), Yellow Locust, Black Walnut, Osage Orange, Honey Locust, Hackberry, Elms, Ash, Kentucky Coffee Tree, Kansas Willow. Spring-time is con-

sidered the most favorable for planting. Insects are not prevalent, the Ash tree only being attacked by borers. The railroad experimental garden at this station is still sadly neglected. It is open ground, through which cattle range; yet during the past two years such of the trees as had not been ruined made a good annual growth. The nature of the subsoil is the main hindrance to tree growth. Being a tenacious clay, it becomes very hard during dry spells of weather. By a deep stirring of the subsoil, much of the difficulty would be overcome, as such treatment would retain the rainfalls, which would furnish moisture to plants. The bottom lands are drift combined with sand, and on them trees succeed. Their roots get the advantage of a sub-irrigation, as it is well known that at a depth with the level of the Arkansas river there is plenty of water in the land, and whenever tree roots reach it the tree is sustained. The Honey Locust has stood the test in this locality the best of any forest trees.

*(South half.—By Morris Collar, Dodge City.)*

Forest-tree planting in 1884 was a success in the county. The knowledge derived from the past years of experience has been valuable, and its application to present treatment of trees is a great help. The following varieties have been the most extensively used: For groves, Ash-leaved Maple, Elm, White Ash, Cottonwood, White Maple; for belts and timber lots, Cottonwood and Honey Locust. Thoroughly prepared land should be used for forest-tree plantations. Set in rows six feet one way and very closely the other, and cultivate as often as necessary to destroy the weeds among them. Failures are attributable to lack of properly prepared land, neglect to give proper cultivation, and not pruning. In forming a plantation, yearling trees are preferable to seeds. The following list, arranged in the order of preference and comparative value for general purposes, is adapted to climate and soil in this locality, and affords a satisfactory growth: Ash-leaved Maple, Box Elder, Cottonwood, Black Locust, Osage Orange, White Elm, Catalpa, Black Walnut. These succeed on upland and lowland. Seeds have not been successful when planted in the fall. Spring-time is best for both seeds and trees. Insects: Borers trouble the Ash-leaved Maple, and a large worm, resembling the tobacco-worm, attacks the foliage of the Cottonwood. Neither is numerous. Rabbits are very troublesome to some kinds of trees while young. By plowing the earth against the rows of trees late in the fall, they will not be so annoying.

GOVE COUNTY.—BY VAN SMITH, HACKBERRY.

Very few forest trees were planted in 1884, but those that were succeeded. Hackberry and Cottonwood were the most extensively used for groves, shelter-belts and timber lots. The system practiced in this county is as follows: Back-furrow the land into ridges ten feet wide until the open furrow is two feet deep. In this furrow dig holes two feet deeper, and plant in rows east and west. The advantage of the deep furrow is to furnish a place in which rains will gather and snows drift, which when melted supplies the moisture needed for vegetation. It is a good plan to plant sorghum between the rows to shade the ground and young trees, leaving the stalks to stand through winter as a catch for snow-drifts, which will furnish moisture for another year. Failures are mainly caused by neglect of proper cultivation. Seeds or young trees are safe to use, but if trees they should be closely trimmed at time of setting. Seed of Black Walnut do best if sprouted before planted. The following list is recommended to planters for their adaptation to climate and soil, and satisfactory growth: Honey Locust, Black Walnut, Catalpa (Western Hardy), Ash-leaved Maple, Osage Orange, Cottonwood, White Elm, Red Elm, White Maple, Black Walnut, Green Ash, White Ash. For uplands, the Hackberry, Osage Orange, Black Locust; for lowlands, Hackberry, Black Walnut, Osage Orange, Honey Locust, and Cottonwood. Seeds do best when planted in spring; but such seeds as can



be safely prepared and kept over till spring should be so handled. Young trees give the greatest satisfaction when planted in the fall. Insects: There are none which are prevalent among the forest trees in this county yet.

GRAHAM COUNTY.—By ROBT. BOYS, WHITFIELD, AND JAS. BAIRD, LENORA.

All forest-tree plantations made a fine growth in 1884 where properly taken care of. Cottonwood, Ash-leaved Maple, Walnut, Catalpa, Ailantus, Honey Locust, Maple, Ash and Osage Orange have been most extensively used for groves; Cottonwood for shelter-belts, because of its very rapid growth; Ash, Walnut, Honey Locust and Ash-leaved Maple for timber lots. Many systems for management have been tried, and it has finally resulted in adopting the following: Plant in rows eight feet apart and two to four feet in the row, and thorough and constant cultivation, or the same as required to produce a good crop of corn. The space between the rows should be planted to corn, the product of which diminishes the expenses, and becomes an encouragement to farmers to plant trees. Dry seasons and poor culture have been the main causes of failures. When the land has been well prepared, would use seeds planted in rows to remain; but seedlings can be safely transplanted and successfully grown. The following list is recommended as adapted to the climate and soil in this section: Ash-leaved Maple, Cottonwood, White Ash, Black Walnut, Black Locust, Osage Orange, Catalpa (Western Hardy), Honey Locust. For uplands, the following list is recommended: Cottonwood, Ash-leaved Maple, White Ash, Ailantus, Osage Orange, Green Ash, Honey Locust, Black Locust, Elm, Black Walnut; for low lands, Cottonwood, Osage Orange, Ash, Ash-leaved Maple, Honey Locust, Elm, Black Walnut. The Elm, Cottonwood, Ash-leaved Maple, Ash and Hackberry are indigenous to this county. All seeds do best planted in autumn, but may be kept over till spring, then soaked in warm water three or four days before planting. Young trees succeed best when planted in spring. Insects: The borer is very damaging to Cottonwood trees, and cut-worms destroy the Honey Locusts as they come up from seed. The area of artificially-planted forests is annually increasing. No indications of premature decay are discovered excepting among Cottonwood and Ash-leaved Maple, when planted on uplands; but this is believed to be caused by drouth and neglect of culture. Wind-breaks are an advantage to growing crops of fruit or grains in modifying the force of winds.

HARPER COUNTY.—By S. H. NESBIT, ANTHONY.

Forest-tree planting in the country the past year was a success. Catalpa, Black Walnut and Black Locust are preferable in the construction of groves; for shelter-belts, Cottonwood, Locust and White Maple. The Russian Mulberry promises now to stand foremost in list of trees for wind-breaks. Catalpa, Locust and Walnut are most desirable sorts to be used in constructing timber lots. As to a general system for forest-tree culture, there is none. Opinions vary, and yet success attends each method equally well. Planted in rows, six to eight feet apart, and thoroughly cultivated during the first three or four years, secures the best results. Forest trees will no more thrive under a neglect of cultivation than corn. They should be cultivated until such age as they will shade the land, and by their dropping leaves make their own mulching. Of some kinds of forest trees it is best to plant seed—such as the Black Walnut—in the place where the future tree is to form. The Catalpa (Western Hardy) and Cottonwood propagate easily by cuttings. When young trees are used, one year old is the most desirable age, and should be cut back at the time of planting. List of kinds recommended for their successful adaptation to soil and climate, and value for general purposes, arranged in the order of preference: Catalpa, Black Locust, Cottonwood, White Maple, Ash-leaved Maple, Black Walnut, White Ash, Russian Mulberry, Honey Locust, Red Elm, Osage

Orange, White Elm. For uplands, Black Locust, White Maple, Green Ash, Russian Mulberry, White Ash and Catalpa should be selected; for lowlands, Red Elm, White Elm, Cottonwood, Ash-leaved Maple, Honey Locust, and Black Walnut. Spring is the proper season to plant seeds or young trees. Insects: The tent caterpillar is the only species found troublesome. It attacks the Black Walnut, Cherry and Apple trees. The area of artificial forests is being extended. No tendency to early decay has been discovered.

JACKSON COUNTY.—By JACOB HIXON, HOLTON.

(*North half.*)

Forest trees planted in 1884 were a success. For groves, Cottonwood, White Maple and Ash-leaved Maple were most extensively used. Some few Black Locust have been planted, but do not prove a success. For shelter-belts generally, White Maple and Cottonwood are used. These were generally planted in rows, and cultivated same as for corn. In most plantings seed has been used. The following list of varieties have proven well adapted to the climate and soil, and are preferred in the order named: Black Walnut, White Maple, Honey Locust, Ash-leaved Maple, Cottonwood, White Elm, Osage Orange, Red Elm. The Osage Orange, White Maple and Ash-leaved Maple succeed on uplands; Cottonwood, Black Walnut, White Elm, Red Elm and Honey Locust on lowlands. Spring-time is generally conceded to be a preferable season for planting. Of insects, the maple worm frequently defoliates Maple trees, and borers ruin the Black Locust tree generally when planted. Rabbits have been troublesome, and compel us to wrap the bodies of trees with paper for a protection. The area of forest-tree plantations has been extended in a small way. Cottonwood trees planted on uplands begin to fail at twelve to fifteen years of age. Shelter-belts planted the south side of orchards are an advantage as a protection from south winds.

(*South half.—By J. W. Williams, Cope.*)

Forest trees planted in 1884, and well taken care of, were a success. The Cottonwood, White Maple and Black Walnut were most commonly used for groves; for shelter-belts, Cottonwood, White Maple, Black Walnut, Red Cedar, and some kinds of Pine; for timber lots, Cottonwood, White Maple, Hard Maple, Black Walnut, Oak, and Elms. The land should receive a preparation similar to that for a crop of corn, and trees carefully planted in rows, ten to twelve feet apart, to permit easy cultivation during the first five or six years. Neglect has been the main cause of failures. I would recommend the using of young trees in forming timber lots of all classes, excepting the Black Walnut, Hickory, and Oaks; for these I would use the seed, which may be planted in the fall, or gathered and bedded out through the winter to be planted in spring. The following list of varieties is well adapted to our climate and soils, and preferred in the order named: Black Walnut, Catalpa (Western Hardy), Red Cedar, White Ash, Green Ash, White Maple, Ash-leaved Maple, Osage Orange, Red Elm, Cottonwood, White Elm, Burr Oak. I prefer the Red Cedar to Honey Locust, as the latter is neither ornamental nor of much value except for fuel; and the Black Locust is rendered valueless by attacks of borers. For uplands I would use Black Walnut, Catalpa (Western Hardy), Red Cedar, White Maple, Osage Orange, and Burr Oak; for lowlands, White Ash, Green Ash, Ash-leaved Maple, Cottonwood, White Elm, Red Elm. Young trees succeed best planted in the spring. Insects: The maple worm is the most numerous, and defoliates Maple trees some years. Borers ruin the Black Locust, and are damaging to Black Walnut and Maple trees where too much exposed. Rabbits have been troublesome. I have tried several different washes, but all have failed to protect the trees. Find a wrapping with straw, old rags, or grass, ample protection. I have not discovered a tendency to early decay among trees on up-

lands, excepting with Cottonwoods, which begin to fail when from fifteen to twenty years old. Shelter-belts are an advantage to fruit-grounds, especially when planted on the south side—by which a protection is given from south winds.

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JEWELL COUNTY.—By E. T. BYRAM, JEWELL.

Forest-tree planting has been fairly a success. The Cottonwood, Ash-leaved Maple, White Maple and Walnut have been most extensively used in the construction of groves; Cottonwood, Ash-leaved Maple, White Maple and Gray Willow for shelter-belts; and Black Walnut, Ash, Ash-leaved Maple and Cottonwood for timber lots. These should be planted in rows eight feet apart and two feet in the row, and thoroughly cultivated with plow and hoe through the season, and kept up each year until the trees are large enough to shade the land. Neglect of attention has been the cause of failure. Seeds or young trees should be planted where they are to become permanent. All hard seeds should be scalded until they swell, and then planted in similar manner to corn; Maple seed as soon as ripened. Ash, Elm and Ash-leaved Maple should be packed in sand and stored in a cellar till spring. If trees are selected, one or two-year-olds are preferable to any other age, their tops cut back to correspond with loss in roots, and all bruised portions removed. List of forest trees recommended for their value in general purposes, adaptation to climate and soil, and satisfactory growth: Black Walnut, Ash (we have but one kind here), Catalpa, Honey Locust, Ash-leaved Maple, Cottonwood, Osage Orange, White Maple, White Elm, Red Elm. The Black Locust is utterly worthless in any part of the west that I have a knowledge of; or perhaps I should say that it is useless to attempt to raise it, on account of the liability of borer attacks. Its wood is good. In Illinois I had the labor of years swept away by this borer, in two seasons. Plant more of the Honey Locust. For uplands the Catalpa, Honey Locust, Ash, Cottonwood and White Maple are preferable. Most all varieties named in the list are successfully grown on lowlands. Of seeds I would plant the Black Walnut in the fall, and keep others in a moderately damp cellar till spring. With young trees I have succeeded to my entire satisfaction by planting in spring. Insects: The borer is often destructive to many kinds of trees when not in a thrifty condition. Lately a small beetle has defoliated and killed a good many Cottonwoods in groves and belts. Rabbits are not very troublesome to forest trees in this county. A very little rubbish placed securely around forest or fruit trees, will be found sufficient protection. The area of plantations for shade and ornamentation around the farm dwellings and along public highways is being rapidly extended. Early decay: The Cottonwood where planted on uplands has indicated a tendency to early failure. Such is not the case with any sort planted on lowlands. Shelter-belts are an advantage to fruit plantations in the protection afforded from violent winds.

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KINGMAN COUNTY.—By L. W. LEACH, KINGMAN.

Forest trees planted in 1884 were reasonably successful. The Catalpa, Ash-leaved Maple, Ash, Honey Locust and Black Walnut were most commonly used for groves; for shelter-belts, the Cottonwood, because of its rapid growth and easy propagation; for timber lots, Cottonwood, Ash-leaved Maple, Ash, and Black Walnut. These should be planted in rows from four to six feet apart, and given clean cultivation. Failures are principally due to carelessness in planting, and neglect of cultivation. I prefer young trees of most classes. If seed is to be used, it should be kept moist, either in a cellar or buried in earth until spring, and then planted in thoroughly-prepared land. I have found it best to sow the seed in nursery form, and cultivate the trees until one-year old, and transplant to places intended for the permanent stand. For uplands, White Ash, Green Ash, Ash-leaved Maple, Osage Orange, Catalpa and Honey Locust are preferable; for

lowlands, Black Walnut, White Maple, White Elm, and Red Elm. The culture for either upland or lowland is not necessarily different. Both require such as will keep weeds down and the land loose. Spring-time is generally the most favorable for planting. Insects are not prevalent, nor rabbits troublesome to forest trees. The area of forest-tree plantations is being gradually extended each year, and on either uplands or lowlands are healthy. Shelter-belts are an advantage to fruit grounds and field crops, in the protection given from the force of violent winds.

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LABETTE COUNTY.—By J. L. WILLIAMS, OSWEGO.

Forest-tree planting in 1884 was a success. The *Catalpa Speciosa* was most extensively used for all purposes. Forest plantations should be constructed in rows six feet apart, and thorough cultivation given during the growing season. I would recommend seed planting of the Black Walnut and one-year-old trees of *Catalpa*. Cut back to the ground the first year's growth the following spring. List of varieties arranged in the order of preference and ready adaptation to climate and soil, and for successful growth: *Catalpa*, Black Walnut, Honey Locust. These are adapted to either upland or lowland locations. Fall planting is preferred for seeds in this section, and either fall or spring for young trees. The area of forest-tree plantations is annually being extended, and no tendency to early decay has yet been discovered among trees on uplands or lowlands. Shelter-belts have been an advantage to orchard and field crops. They prevent fruit from being blown off, and modify extremes of weather. Of pests, no insects but the maple worm have been prevalent. Rabbits have done serious injury to groves, and are exterminated by trapping.

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LINCOLN COUNTY.—By JACOB WEIDMAN, PLEASANT VALLEY.

The planting of groves, belts and timber lots was a success in 1884. Varieties used most extensively for groves were Ash, Honey Locust, *Catalpa*, White Maple, Osage Orange, and Mulberry; for belts and shelters, Cottonwood, White Maple, and *Catalpa*; for timber lots, Osage Orange, Honey Locust, Ash, and Walnut seed. These were planted in rows four to six feet apart—I prefer the latter distance—and given clean culture during the first part of the summer. Failures are mainly due to using poor plants, and neglect in their care. I would recommend the use of young trees not over one year old for all sorts excepting the Black Walnut; of that I would use the seed. List of varieties adapted to our climate and soil, and which make a satisfactory growth, arranged in the order of preference: Black Walnut, *Catalpa* (Western Hardy), Honey Locust, Black Locust, White Ash, Green Ash, Cottonwood (but best for low lands), White Elm, Red Elm, White Maple, Ash-leaved Maple. This last variety does poorly on upland. The same may be said of Cottonwood, Maple, and Osage Orange. The Black Walnut, *Catalpa*, Honey and Black Locust are the most substantial sorts for either upland or bottom land. Mulberry, Ash and Elms are slow growers on upland; do much better on bottom land. I would recommend planting all classes of seed which can be kept over without injury, in the spring; and the same season is preferable for young trees. Most seeds can be safely preserved through winter by mixing them with moist sand in about equal quantities. Insects: Cottonwood, Ash-leaved Maple, Elms and Maple trees suffer from the attacks of flat-headed borers. Whenever in a feeble state such trees should have shade, mulch, and clean cultivation. Rabbits are quite troublesome, and are exterminated by using the "common sense" trap, and a supply of cats, English hounds, and a good shot-gun. Shelter-belts are highly beneficial to orchards, as those protected yield a full crop, while those not protected fruit only on the north side of the tree. They are equally valuable to agricultural interests when constructed on the south side of fields of grain.

MARION COUNTY.—By J. B. DOBBS, ANTELOPE.

*(North half.)*

There were very few forest trees planted in 1884, but such as were made a very heavy growth, and were mostly Cottonwood. In the formation of timber lots, groves, and belts, I would recommend the use of young trees, excepting Black Walnut, which should be started with seed, and planted in a permanent place, which had been previously prepared in manner required for corn. List of all kinds adapted to climate, soil, and which make a satisfactory growth, arranged in order of preference: Catalpa (Western Hardy), Black Walnut, Osage Orange, Cottonwood, Red Elm, Black Locust. The Ash-leaved Maple has no value except for wind-breaks. Catalpa and Black Locust are adapted to upland; Cottonwood and Black Walnut to lowlands. All kinds of seeds which can be preserved through the winter, should be planted in spring. This can be done safely, if kept in a dry, cool room. I have grown Ash-leaved Maple and White Ash from seeds kept in a kitchen all winter. I prefer spring-time for planting young trees. Rabbits are troublesome, which compels the wrapping of trees. The past winter I used a wash made as follows: 1 quart rye flour,  $1\frac{1}{2}$  pounds sulphur, 2 ounces tincture asafetida, in 2 gallons of water, brought to a boil, and put on with a brush. On uplands, the Cottonwood begins to fail at twelve to fifteen years. This does not occur to trees planted on lowlands.

*(South Half.—Wm. Mears, Peabody.)*

Forest-tree planting was a success in 1884. For groves, Catalpa, Walnut, Russian Mulberry, Cottonwood and Ash-leaved Maple were most extensively used; for shelter-belts, Walnut, Cottonwood, Russian Mulberry, and Osage Orange; for timber-lots, Walnut, Russian Mulberry and Catalpa, and in some localities the Osage Orange was planted. The latter does well on all kinds of soil. I would recommend the use of seed of the Black Walnut and White Maple, cuttings of the Cottonwood and young trees of the Mulberry, Catalpa and Ash-leaved Maple in the formation of timber-lots. These should be in rows four feet to six feet apart, and given level and frequent cultivation. Failures were mainly due to attacks of insects and neglect in culture. Land for forest-tree plantations should receive deep plowing and harrowing before planted. Trees should be cut back to the ground the spring following planting. This will cause a straight and vigorous stalk to form, which will be an advantage to the value of the future tree. List of trees adapted to climate and soil, and affording a satisfactory growth, arranged in the order of preference: Black Walnut, Russian Mulberry, Catalpa (Western Hardy), White Ash, Green Ash, Honey Locust, Ash-leaved Maple, Red Elm, White Elm, Black Locust. Cottonwood trees are worthless either alive or dead; are short-lived on upland, but do better on lowland; in some locations are successfully used for wind-breaks. The Black Walnut, Russian Mulberry, Osage Orange, Yellow Poplar, White Ash, Green Ash, Catalpa, Honey Locust and Black Locust are adapted to upland. All the kinds named in the foregoing list are adapted to lowlands. In either location, thorough culture with an occasional dressing of the land with manure, should be given forest trees, So far as practicable, all classes of seeds should be planted in autumn and young trees in spring-time. I would recommend cutting back all kinds of trees except the Maple, and early in the spring following their planting, to encourage the formation of a straight shoot which is to become the future body of the tree. Insects: The flat-headed borer attacks the Maple and Cottonwood trees during the season of transplanting. Rabbits are troublesome, and cause no small amount of discouragement to the planter. The Cottonwood shows a tendency to decay on uplands at eight or ten years old whenever its cultivation is neglected. Shelter-belts have been alike beneficial to orchards and field crops.

## MARSHALL COUNTY.—BY JOHN MCKEE, MARYSVILLE.

Forest trees planted in 1884 were successful. The Cottonwood, Maple and Black Walnut were most extensively used for groves; for shelter-belts, Cottonwood, because of its rapid growth; and Ash principally for timber-lots. These are generally set in rows four feet apart each way, and kept clean by cultivation. Failures are mainly due to neglect. I prefer using young trees for such purposes, and spring-time for their planting. If seeds are used, they should be sown in autumn. The following list of varieties is recommended as well adapted to upland or lowland locations: Black Walnut, Red Elm, White Ash, Black Locust. Insects nor rabbits trouble forest trees in this section. The area of forest-tree plantations is gradually being extended. Shelter-belts have been a great advantage to orchards, in protecting their fruit from violent winds which occur during the summer.

## McPHERSON COUNTY.—BY THEO. BOGGS, McPHERSON.

Forest trees planted in 1884 were a success. Varieties most generally used for all purposes were Cottonwood, Ash-leaved Maple, Catalpa, Black Locust, and Black Walnut. Seed of the Black Walnut and cuttings of Cottonwood are generally used, and of Maple, Catalpa, and Locust, one, two and three-year-old trees. These are set in rows, eight to twelve feet apart, and given the same cultivation which is necessary for a corn crop. Failures were mainly due to neglect. I would recommend using seed of kinds of trees which form and depend on a tap-root. Generally, two-year-old trees are used; cultivated during the forepart of the growing season, and then well mulched. The following list of kinds is recommended for this locality, and preferred in the order named: Black Walnut, Catalpa (Western Hardy), Honey Locust, Osage Orange, Black Locust, Red Elm, White Elm, White Ash, Ash-leaved Maple, Green Ash, Cottonwood, White Maple. Perferable for uplands, Black Walnut and Osage Orange; for lowlands, Black Walnut, Honey Locust, and Black Locust. Spring-time is generally considered the most favorable for planting either seed or young trees. Seeds can be kept through winter by mixing them with moist sand or earth, packed in boxes. Of insects, caterpillars have been injurious, and have been picked off and mashed. Rabbits are troublesome, and held in check by trapping and shooting. The area of forest-tree plantations is being annually extended. There is a tendency with the Cottonwood to an early decay when planted on uplands; it begins when cultivation ceases. Shelter-belts have always been an advantage to fruit grounds and field crops, in the protection afforded from winds, and their influence in preventing rapid evaporation of moisture.

## MITCHELL COUNTY.—BY E. A. TAYLOR, BELOIT.

Forest-tree planting was a success in 1884. For groves, Catalpa (Western Hardy), White Maple, Elms, Ash, Cottonwood, Black Walnut and Ash-leaved Maple were most extensively used; for shelter-belts, Cottonwood, Honey Locust, Ash-leaved Maple, and White Willow; for timber-lots, Catalpa, Ash, Black Walnut, Honey Locust, Cottonwood, Osage Orange, and Ash-leaved Maple. These were set in rows eight to ten feet apart, and given clean, level cultivation the same as for corn. Failures are mainly due to neglect in a proper treatment, and an attempt to use sorts not adapted to our climate. I would recommend the use of one or two-year-old trees of all kinds except Black Walnut and Cottonwood. Of the first, plant the nuts in the fall, two in a place, where the future tree is to stand. List of varieties recommended as adapted to climate and soil, and making a successful growth, in the order of preference: Catalpa (Western Hardy), Honey Locust, White Ash and Green Ash, Cottonwood and Black Walnut, Ash-leaved Maple, Osage Orange, Red Elm, White Elm and White Maple. Catalpa, Honey Locust, Ash, Black Walnut, Osage Orange, Elm and White Maple are adapted to upland culture;

and the entire list above given is adapted to lowlands. I recommend autumn for the planting of nut varieties only, and spring-time for young trees. Insects have not been prevalent. Rabbits have been and are troublesome, compelling planters to wrap their trees with paper, cloth, or hay ropes, or wash the bodies with a compound of soft soap and sulphur. The Cottonwood has shown a tendency to early decay on our uplands only when planted too closely and neglected. Shelter-belts have been beneficial to orchards when planted on the south and west.

MONTGOMERY COUNTY.—BY P. C. BOWEN, CHERRYVALE.

Forest trees which were in good condition, planted on well-prepared land and given proper culture, were a success in 1884. White Elm, White Ash, Honey Locust, Catalpa, (Western Hardy), Walnut, Cottonwood, Osage Orange, White Maple, and seedling Peach trees were extensively planted for shelter-belts, and in rows eight to ten feet apart, given moderately shallow plowing and hoeing, and heavy mulching in July. Failures are mainly due to improper planting, poor culture, and neglected mulching. I would invariably plant Black Walnut seed on the ground where the tree is to permanently grow, but of other sorts would use one or two-year-old trees. Land to be used for seeds or trees should be deeply prepared by plowing and pulverizing with a harrow. Young trees should be prepared by shortening-in about one-third of their tops, and trimming off all bruised roots. In regard to the following list, I have noted the experience in this locality: Black Walnut, good; Catalpa (Western Hardy), best; Honey Locust, worms destroy it badly; White Ash, succeeds well; Green Ash, untried; Box Elder, untried; Osage, very hardy—excellent; Cottonwood, does well—rapid grower; White Elm, does well—slow grower; Red Elm, only tolerable; White Maple, good—worms eat leaves badly; Black Locust, untried. List suited to uplands, Catalpa (Western Hardy), Osage Orange, White Ash, White Maple, Honey Locust; to lowlands, Black Walnut, White Elm, Red Elm, Cottonwood. I would recommend autumn as the best season for all classes of forest-tree seeds which do not require planting immediately after ripening, and the month of February for young trees of a deciduous character. Insects: Borers work badly on the trunks of Honey Locust and White Elm, and worms seriously injure the foliage of the White Maple. Rabbits are troublesome. The jack or “mule-eared” injure the Catalpa seriously. To protect against their work, wrap the trees with heavy paper or split corn-stalks. The area of forest-tree plantations is slowly extending in this county. Shelter-belts are beneficial to orchards and field crops, by checking the force of winds, which are damaging from the south in summer.

MORRIS COUNTY.—BY F. B. HARRIS, WHITE CITY.

Forest-tree planting in 1884 was successful. The Ash-leaved Maple, Ash and Red Cedar were most extensively used for groves, Cottonwood for shelter-belts, and Walnut for timber-lots; were largely planted in rows four feet apart, and given thorough culture. I would recommend planting the seed of Walnut, Ash-leaved Maple, Maple and Ash in the place where they are to make a permanent tree. Of Cottonwood would use young trees. List of kinds adapted to climate, soil, and which make satisfactory growth, arranged in order of their preference: Black Walnut, Cottonwood, Ash-leaved Maple, White Ash, Honey Locust. List for uplands, the White Ash, Black Walnut, and Cottonwood; for lowlands, Elms, Maples, and Locust. Fall for planting seeds is considered the preferable season, and spring-time for young trees. Insects and rabbits have been troublesome. To protect against rabbits we wrap the trees with hay, cornstalks, or paper. The Cottonwood shows a tendency to decay, where planted on upland, at seven or eight years old; on lowlands no such tendency has developed. Shelter-belts are alike beneficial to orchard trees and field crops, in the protection they afford against prevailing winds, which are often accompanied with a cloud of dust.

## NEOSHO COUNTY.—BY C. W. HAYDEN, THAYER.

A very few forest trees were planted in this county in 1884. Such as the White Maple, Catalpa (Western Hardy), Black Walnut, Cottonwood, Osage Orange, Honey Locust and Ash-leaved Maple were most commonly used for groves; for shelter-belts, White Maple, Cottonwood, Black Walnut, Osage Orange, and some Catalpa. These were set in rows eight feet apart and two feet in the row, and given clean cultivation until they were large enough to shade the ground. Failures are the result of neglect in planting or culture. I would recommend that the seed of all nut-bearing sorts be planted where the tree is to grow, and land for such should be prepared in the fall, and in time for the seed as soon as ripened. Of trees, one year old are preferable to any other age, and should be planted as early in spring as practicable. The following list is recommended as best adapted to climate and soil, and arranged in the order of their preference: Catalpa (Western Hardy), Black Walnut, Osage Orange, Ash-leaved Maple, Honey Locust, Cottonwood, White Maple, White Elm. For upland, all of this list are adapted except Black Walnut, which should have first-class bottom land. Such seeds as do not require planting at the time of ripening, as Cottonwood and White Maple, may be preserved until spring by packing in moist sand and storing in a cellar. Insects have not been prevalent. Rabbits have been troublesome, and are exterminated by hunting and killing. The area of forest-tree plantations is being annually extended. Shelter-belts have been an advantage to orchards, by breaking the force of violent south and southwest winds in spring and fall. Every orchard in this part of the State, which has been unprotected, leans to the northeast, and has suffered from sun-scald and borers, caused by the exposure.

## NEMAHA COUNTY.—BY S. J. EDGERLY, SENECA.

Forest-tree planting in 1884 was successful though not extensive, for the reason that most of our lowland farms are protected with natural timber-belts, and the uplands have quite extensive orchards which furnish their own protection; my own, planted twenty-three years ago, have become amply protected. White Maple, Cottonwood and Walnut are most extensively used in the construction of groves. White Maple, Cottonwood and Walnut were used in an early day, to which of recent day have been added Catalpa, Mulberry, Osage Orange, and Ash-leaved Maple, for shelter-belts. For timber-lots, I would add to the first list, Honey Locust, Ash, Elm, and Hickory. These are most successful when planted on well-prepared land, in rows four to six feet apart, and cultivated the same as for corn. Failures are mainly due to poor management. I would recommend the use of young trees, grown in nursery form, from one to three years; and when the ground is prepared, list it in rows each way, and set a tree at each cross-check; a mulching as soon as planted is beneficial. List recommended as adapted to climate and soil and making a satisfactory growth, is: Black Walnut, Honey Locust, White Ash, Green Ash, Box Elder, Osage, Cottonwood, White Elm, Red Elm, White Maple. For upland, the Osage Orange is the best; all the varieties do well on lowlands. Spring-time is generally considered preferable for seed or young tree planting. Seeds may be safely preserved over winter by mixing them with sand. Insects: Borers attack puny or weakly trees during dry, hot summers; as a prevention, good culture and thorough mulching have been successful. Rabbits are troublesome. The handiest and cheapest method I find for a protection is a wash made of 3 lbs. of sulphur, 1 lb. flour, to a bucket of water, well mixed, and applied with a brush. There is discovered a tendency to early decay of the Cottonwood and White Maple, when planted on the uplands from fifteen to twenty-five years. Shelter-belts have been an advantage to young orchards and vineyards and to field crops, in averting the force of heavy winds.



## NESS COUNTY.—By J. W. BIDWELL, WELLMANVILLE.

The year 1884 was unusually favorable to tree growth, and all the trees I know of did well. The Cottonwood was most extensively used, and planted in rows four feet apart, and given good cultivation. I know of no failures. If any occurred, the cause must certainly have been from lack of cultivation. I think it best to plant all forest seeds in nursery form, and transplant the trees when one or two years old, excepting the Walnut. I would recommend yearling trees as most suitable for planting. My experience has convinced me that only a very few kinds thrive in the county, and latterly I have confined my attention to Walnut, Catalpa (Western Hardy), Cottonwood, Ash-leaved Maple, Ash, and a few Hackberry. I have failed with the Locusts, White Maple, Chestnut, Hickory, and Mountain Ash. Very likely some of these would succeed now, as we know more of methods than a few years ago. I have arranged the following list from my own experience: Black Walnut, Catalpa, White Ash, Ash-leaved Maple, Osage Orange, Cottonwood. This list as given, in my opinion, would be as valuable as any you could recommend for this part of the State. All things considered, I prefer spring for planting. Seeds, such as Ash and Ash-leaved Maple (Box Elder), require a light covering, and if planted in fall would very likely be blown away before spring. These and other light seeds should be well mixed with slightly moist sand, or sandy soil, and packed in keg or box for winter. I plant young trees in spring-time. Sometimes dig them and heel in during the fall. I know of no advantage in spring planting other than to save an exposure to the rabbits one winter. Insects: My Locusts were eaten by bugs, and last summer a light-colored worm attacked the Ash and would have defoliated them, but by shaking off and killing them I saved the trees. Walnut, Catalpa, Cottonwood and Ash-leaved Maple have escaped all damages from insects so far. Rabbits are troublesome, and I know of no means to protect our trees from their attacks except by wrapping the trunks with cloth or tarred paper. The area of forest-tree plantations is slightly extending in this county.

## NORTON COUNTY.—By SAM. MEANS, NORTON.

All timber seed and cuttings planted in 1884 made an excellent growth, which surpassed that of any preceding year since the first settlement of the county. Varieties most extensively used for groves, were Ash, Walnut, Locust, and some Ash-leaved Maple; for belts, Locust and Osage Orange; for timber-lots, Walnut, Ash, and Locust. The system adopted by the planters has been governed by the terms of the "timber-culture act" of Congress. Failures have often been the result of the selection of unsuitable lands. I would recommend the following list as adapted to climate and soil, preferred in the order named: White Ash, Black Walnut, Honey Locust and Osage Orange, Ash-leaved Maple, Cottonwood. The Red Elm is a good timber tree, but is little cultivated. Varieties suited for upland culture, Ash, Honey Locust, and Walnut; for lowlands, Ash-leaved Maple, Cottonwood, and Elm. Spring-time is considered the most suitable season for planting both seed and young trees. Insects are not troublesome; rabbits are, during winter. The area of forest-tree plantations is being extended. Cottonwood trees on upland are failing. Shelter-belts are a great advantage to the farms in this section—first, as an obstruction to violent winds; and second, as a check to drifting snows, which are held upon the land, and melting, add to the moisture in the land.

## OSAGE COUNTY.—By H. DUBOIS, BURLINGAME.

There were but few timber groves, belts and lots planted in 1884, but such as were did well. For groves, shelter-belts and timber-lots, Black Walnut, Ash, Red Elm, White Elm, Hickory and Honey Locust were most commonly used. These were planted in rows six feet apart and four feet in the row, and given the same culture as required for

corn. I would recommend the using of both seeds and young trees, planting the former in autumn and the latter in spring-time. The following list of varieties is adapted to climate and soil, and to be preferred in the order named: Black Walnut, Honey Locust, Red Elm, White Ash, Green Ash, Osage Orange, Cottonwood, White Elm, White Maple, Ash-leaved Maple. The Black Locust is worthless, on account of the injury done it by borers. For uplands, the Cottonwood, Honey Locust, White Maple and Osage Orange are most suitable varieties. The Black Walnut, Ash, Red Elm and White Elm do best on bottom lands. Seeds should be planted in autumn, and the sooner after ripening the better. Young trees thrive better planted in spring-time. Insects: Worms defoliate the Maples, and borers attack the Black Locust. Rabbits are not troublesome. The area of forest-tree plantations is being annually extended in this county. The early decay of Cottonwood trees has been noticed as occurring on the uplands only. Shelter-belts are an advantage to orchards, in the protection given from hot south winds.

OSBORNE COUNTY.—BY M. MOHLER, OSBORNE CITY.

Forest trees planted in 1884 were a success wherever properly cared for. For groves, the Cottonwood, Honey Locust, Black Walnut, White Maple and Ash-leaved Maple were most commonly used; for shelter-belts, the Cottonwood, Maple, and seedling Peach trees; for timber lots, Black Walnut and Honey Locust. These were planted in rows eight feet apart and four feet in the row, and cultivated the same as corn. Failures are mainly due to neglect and unsuitable kinds for the location selected, as the Cottonwood for uplands. The Black Walnut succeeds best when its seed is planted where the tree is to grow. Other varieties are best grown by planting their seed in nursery form, cultivated one or two years, and then transplanted to permanent grounds. I would recommend the following varieties as well adapted to climate and soil, and preferred in the order named: Honey Locust, Black Walnut, Ash-leaved Maple, Cottonwood, Osage Orange, and Ash. Of this list all kinds except Cottonwood succeed on upland. For seed planting, autumn for Black Walnut, and spring for all others; and young trees are preferable. Insects: None are prevalent but borers, which are removed from the trees with a knife. Rabbits are troublesome to forest trees; and for protection from their attacks, wrapping with paper, corn-stalks or straw is necessary. The area of forest-tree plantations is annually being extended. All classes of trees succeed on our lowlands, and only the Cottonwood shows a tendency to decay on the uplands. This generally begins about the fourth or fifth year, and I think could be prevented by mulching. Shelter-belts are an advantage to fruit grounds and field crops, by the protection afforded from hot winds in summer and cold during the winter.

OTTAWA COUNTY.—BY J. W. McLAREN, SUMMERVILLE.

I know of no plantation of forest trees made in 1884, but those of preceding years made a good growth. For groves, Cottonwood, Walnut, Ash-leaved Maple, and Ash; for shelter-belts, Cottonwood and Ash-leaved Maple; for timber-lots, Walnut, Ash-leaved Maple, and Cottonwood. The trees should be planted close enough to get the required number of trees in rows one rod apart, which will admit of culture with a double team, which should be frequent during the growing season. I would recommend planting the seed of Black Walnut where intended to remain, as the tree does not thrive so well by transplanting. Cottonwood can be easily grown from cuttings. Plant seed of Ash-leaved Maple and Ash in nursery form, and grow until one year old; then transplant to where they are to form trees. Land to be used for forest-tree plantations should be thoroughly prepared before used, and seed planted in autumn whenever practicable, but if not until spring, then, just before planting, soak it in water. One-year-old trees are a preferable age. For uplands, use the Ash-leaved Maple, Osage Orange, Green Ash,

White Maple, and Locust; for bottom lands, Cottonwood, Black Walnut, and Elm. Clean culture and a frequent stirring of the ground are important to the success of timber trees on uplands, and equally as advantageous to those on bottom lands, but on account of the greater extent of growth in the same length of time, it is not needed to be continued so many seasons. Seeds do best when planted in autumn, and young trees in spring. Insects have not been prevalent, but rabbits are liable to do great injury unless the trees are wrapped, or mounded, to the branches. Slowly the area of forest-tree plantations is each year being extended. The Cottonwood, on the uplands, begins to fail a year or two after cultivation ceases, and Black Walnuts in four or five years after. Such does not result to these varieties when planted on the bottom lands, where there is ample drainage. Shelter-belts are beneficial to orchards and field crops when planted on the south side. They also afford protection to live stock, planted around the yards and on the range.

PAWNEE COUNTY.—By W. J. COLVIN, LARNED.

(*East half.*)

Forest-tree planting in 1884 was not a success in this county, and was caused by bad management on the part of planters. For groves, the Cottonwood has been most extensively used both in tree and cuttings. It is also used for shelter-belts, being a rapid grower, but no other sort will thrive near it. The Honey Locust ranks next; is hardier as its roots strike deeper into the ground. For timber-lots, Honey Locust, Walnut, Catalpa, are preferred. Rabbits do not attack the Walnut trees. The Catalpa is hardy and endures drouth, but seems to be a favorite sort with rabbits. Land intended for forest trees should be thoroughly prepared by plowing, harrowing and rolling before planting, then set in rows eight to ten feet apart each way. Cultivation should be given the trees each month during the growing season. Mulching in the fall and winter is an advantage to lands which do not retain the snowfall, and trimming should be done in spring. I would recommend the use of young trees as more sure unless the seed is planted in the fall and properly cared for in the spring by cultivation and mulching before the land dries and hardens. In the using of young trees, one-year-olds are best; they should be trimmed clean and the top cut back. In planting, use water, and tramp the earth well around them. Trees which develop a large amount of surface roots are generally gross feeders on the land and should be planted by themselves, and those having heavy descending roots in separate blocks. The following list is suited to upland culture: Black Walnut, Catalpa, Honey Locust, Black Locust, Elm; to lowland, Ash, Ash-leaved Maple, Cottonwood, Maples. Trees do best planted in spring. Insects: Cottonwood trees are sometimes injured in their leaves by worms. Have successfully exterminated them by sifting air-slaked lime upon the leaves. Rabbits are troublesome, and we are compelled to wrap the trunks with paper or old rags, or with long grass, which are reliable preventives. The area of forest-tree plantations is being extended annually. All varieties planted on upland are certain to fail if cultivation is not continued, and in this matter the Cottonwood is the first to succumb. Shelter-belts are of great benefit to fruit trees, field crops and live stock, by the protection afforded from south winds.

(*West half.*—By C. C. Chevalier, Garfield.)

Forest-tree planting in 1884 was a success, where properly done and followed by reasonable attention. For groves, the Cottonwood, Black Walnut, Osage Orange, Ailantus and Honey Locust are preferred; for shelter-belts, Cottonwood, Honey Locust, Black Walnut, Russian Mulberry, and Ailantus; for timber-lots, Cottonwood, Ailantus, Honey Locust, and Black Walnut, when planted in rows eight feet apart each way, and given good culture, are successful. I would recommend the using of yearling trees—if they are thrifty and well grown—of all classes except Black Walnut. Of this, I would plant the

seed in the rows which are to form the grove. List of varieties adapted to climate and soil, and preferred in the order named: Ailantus, Osage Orange, Green Ash, Box Elder, Cottonwood, White Elm, Red Elm, White Maple, and Black Locust. The Catalpa does not stand this climate any better than the Cottonwood. For uplands, I would use Ailantus, Honey Locust, Osage Orange, Red Elm, Russian Mulberry; for lowlands, Cottonwood, Black Walnut, Catalpa (Western Hardy), Russian Mulberry, Ailantus, and Red Elm. Autumn is preferable for seed-planting, if the ground is moist; if not, then the seed can be preserved until spring by packing it in moist sand or soil. Ailantus and Catalpa seed should be kept in a dry condition. For planting young trees, autumn will do, if the ground is in a moist condition; otherwise spring is best. Insects have not been seriously injurious to forest trees. Rabbits are troublesome. The area of forest-tree plantations is being annually extended. The Cottonwood, Catalpa, Ash-leaved Maple, and Walnut, which have been planted on uplands, show a tendency to early decay; also to some extent among trees planted on bottom lands. Shelter-belts have proved an advantage to fruit grounds and field crops, by affording protection from winds, which are exhausting to plants in both winter and summer.

PHILLIPS COUNTY.—BY JOHN W. KNODLE, DICKEYVILLE.

(*North half.*)

The planting of forest trees in groves, belts and timber-lots was a success in 1884, wherever the land was properly prepared, and the trees well cultivated. For groves and timber-lots, Ash-leaved Maple, Green Ash, Honey Locust, Black Locust, Walnut and Cottonwood were most commonly used, while the Honey Locust and Ash-leaved Maple were preferred in construction of belts for shelters. These were planted in rows four feet apart and three feet in the row, and where given good culture did well. I would recommend the use of young trees of all classes, except nut-bearing sorts, for which use the seed for forest-tree plantations. Walnuts should be placed in heaps, covered with dirt in the fall, and allowed to freeze during the winter. Plant in spring, in rows four feet apart and three feet in the row, and with each nut drop a couple of grains of corn. If the nuts grow remove the corn, otherwise let it remain to indicate the failure, which will facilitate the replanting another spring. In planting young trees, I prefer yearlings of the strong-growing sorts, and two-year-old trees of slower kinds. At time of setting, cut the top back to three inches of the collar, and dip the roots in thick mud. I would recommend the following list of varieties as adapted to climate and soil, and to be preferred in the order named: Ash-leaved Maple, Black Locust, Green Ash, Honey Locust, Catalpa (Western Hardy), White Elm, Red Elm, Cottonwood, Osage Orange, Black Walnut. The European Ash is very successful here. For uplands, the Honey Locust, Black Locust and Green Ash are best adapted; for lowlands, Black Walnut, Catalpa, White Ash, Green Ash, Ash-leaved Maple, Osage Orange, Cottonwood, White Elm, Red Elm, and Maples. Fall is a preferable season for planting both seeds and young trees. Insects or rabbits have not been troublesome to forest trees. The area of forest-tree plantations has been extended very slowly in this county. Shelter-belts are beneficial to fruit growers, by protecting the trees and plants from dry, cold and hot winds, and preventing too rapid evaporation of moisture, sudden changes in temperature, and retaining the snow that it may melt and add to the moisture in the land.

(*South half.*—By H. S. Granger, Phillipsburg.)

Forest-tree plantings were a success in 1884. For groves, the Black Walnut, Ash-leaved Maple, Ash, Cottonwood, Honey Locust, Catalpa (Western Hardy), Elm and Oak were most commonly used. These were planted in rows four feet apart each way, and given good cultivation. Failures were caused mainly by neglect. I would recommend

the use of seed, and cultivation of the same as corn until one year old; then in fall, if the season is suitable and ground moist, transplant to the places prepared for them, cutting back the tops to correspond with the strength of their roots at time of setting. I would recommend the following list of varieties, and in the preference denoted by their order named: Black Walnut, Catalpa (Western Hardy), White Elm, Ash-leaved Maple, Honey Locust, White Ash, Hackberry. The Cottonwood succeeds on lowlands; White Maple winter-kills. For uplands, the White Elm, Catalpa (Western Hardy), Hackberry and Ash-leaved Maple succeed; for lowlands, the Black Walnut, Cottonwood, and Ash. Insects: There is a large green worm which feeds on the leaves of some varieties. Very little has been done to extend the area of forest-tree plantations in this county. Such efforts are principally confined to entries made under the "timber-culture act" of Congress. The Cottonwood tree is apt to fail at six or seven years of age, when planted on uplands. Shelter-belts are an advantage to fruit grounds, by the protection afforded.

POTTAWATOMIE COUNTY.—By JOS. LEACH, HAVENSVILLE.

(*North half.*)

Forest-tree plantings in 1884 were successful. Trees were planted in rows six to eight feet apart and three to four feet in the row, and given such cultivation as is required for corn. There were no failures where proper attention was given. I would recommend the using of young trees in the forming of timber-lots, as using seed for large plantations makes a tedious job in their cultivation; and if seed must be used it is much better to plant them in nursery form and grow them one year, then transplant to well-prepared land, cutting them back to about six inches high at time of setting. List adapted to upland: Black Walnut, Catalpa, Ash-leaved Maple, White Ash, Osage Orange, and White Maple. For wind-breaks I would add Gray Willow and Russian Mulberry. Spring-time is preferable for planting both seed and young trees. Insects: Maple worms and May beetles feed upon the foliage. Rabbits do not trouble forest trees seriously. The area of forest-tree plantations is slowly extending each year. Cottonwood trees planted on uplands only are short-lived, and begin to fail at from eight to ten years. Shelter-belts are an advantage to orchards and field crops. The trees grow into better form, and the fruit is not blown off as in open, exposed places.

(*South half.*—By Judge John A. Beal, Louisville.)

Forest-tree planting in 1884 was a success. Varieties commonly used for groves, Cottonwood, Catalpa, Black Walnut, and White Maple; for shelter-belts, Cottonwood, White Maple, Ash-leaved Maple, and Willow; for timber-lots, Black Walnut and Catalpa (Western Hardy). Land to be used for forest trees should be thoroughly prepared. Plant in rows twelve feet apart and six feet in the row; cultivate with reference to drainage and keeping down the weeds. But few failures occur in this section. I would recommend the using of young trees of all kinds except the Black Walnut, of which it is best to use seeds. Raising plants requires gardener's work; and if seeds are planted in plantations the probability is that weeds will ruin the young plants in spite of the best efforts. The Black Walnut and Black Locust seeds will do well planted in the grove form. I would recommend the following list as well adapted to climate and soil, and to be preferred in the order named: Catalpa, Black Walnut, Osage Orange, Ash-leaved Maple and Cottonwood, White Maple, Black Locust. For uplands, Catalpa, Black Walnut, Ash-leaved Maple, Osage Orange, Black Locust; for lowlands, Cottonwood, White Maple, White Elm, Red Elm. Spring is generally considered the most favorable season for planting. Insects have not become prevalent, nor rabbits troublesome. The area of forest-tree plantations is annually and gradually being extended.

RENO COUNTY.—BY J. J. MEASER.

*(North half.)*

The planting of forest trees in 1884 was very successful. Varieties largely used for groves, Catalpa and Russian Mulberry; for shelter-belts, on sandy land, Cottonwood; for timber-lots, Black Locust, Black Walnut, Catalpa, Russian Mulberry, Honey Locust, Ash-leaved Maple, White Ash, and Osage Orange. In sandy, or light soils, the rows should be opened with a lister, four feet apart, and plants set deep in the row, from two to four feet, and by cultivation work the dirt back against the plants until the surface is level. There were no failures the past year that I am aware of. I would, by all means, recommend the using of good one-year-old trees in setting out a forest-tree plantation, excepting those sorts which bear nut seed. These should be planted in well-prepared land, (in furrows opened with a single-shovel plow,) and from one to two feet apart in the rows, thinning out the next year where too thick. Spring-time has been the most favorable for planting either seeds or young trees. The latter class should be cut back to within four inches of the collar at time of setting. I would recommend the following list of varieties as well adapted to climate and soil, and to be preferred in the order named: Black Locust, Catalpa (Western Hardy), Black Walnut, White Maple, Honey Locust, Ash-leaved Maple, White Ash, Red Elm, White Elm, Cottonwood. For uplands, the Black Locust, Honey Locust, Russian Mulberry and Catalpa are preferable; for lowlands, Black Locust, Catalpa, Black Walnut, White Maple, Honey Locust, Ash-leaved Maple, White Ash, Red Elm, White Elm, Cottonwood, Osage Orange and Mulberry have all been successful. Insects are not prevalent among forest trees here. Rabbits are troublesome, but are held in check by trapping and shooting. The area of forest-tree plantations is being annually extended, but not so rapidly as should be, on account of the scarcity of plants. The Cottonwood and Ash-leaved Maple, planted on uplands, begin to fail at from five to ten years, wherever not well cultivated. Shelter-belts are an advantage to orchards, by checking violent winds which injure the bloom and loosen the trees at the roots; and to field crops by preventing light soils from drifting, and the tearing and blowing down of plants.

*(By A. M. Switzer, Hutchinson.)*

Forest-tree planting was a success in this locality in 1884. For groves, Cottonwood, Catalpa, Black Walnut, Ash-leaved Maple, and Russian Mulberry; for shelter-belts, Cottonwood and Ash-leaved Maple; for timber-lots, Black Walnut, Catalpa and Osage Orange were most extensively used. These were planted in rows four feet apart each way, and given thorough cultivation. Failures were mainly due to neglect in culture. I would recommend the using of young trees, not more than one year old, for such purposes, of all classes except the Black Walnut, which should be started by dropping its seed where the tree is to grow. If seeds are used, the land must be well prepared by deep plowing and harrowing. Plant the seed in autumn about one inch deep, that it may freeze and thereby germinate more readily in the spring. The following list of varieties is recommended as adapted to the climate and soil, and is preferred in the order named: Black Walnut, Catalpa (Western Hardy), Ash-leaved Maple, White Ash, Green Ash, White Maple, Osage Orange, Mulberry, White Elm, Red Elm, Kentucky Coffee Tree. Honey and Black Locust are subject to depredations of borers. Cottonwood is too short-lived. For uplands, Black Walnut, Catalpa, Ash-leaved Maple, White Ash, Green Ash, Osage Orange, White Elm, Red Elm, White Maple and Kentucky Coffee Tree, succeed; for lowlands, the Mulberry and Cottonwood. Seeds are more successful planted in autumn, while young trees should be set in early spring. Insects are not prevalent. A few borers are found working in the Locust and Ash-leaved Maple. Rabbits are not troublesome to forest trees in this section. The area of forest-

tree plantations is annually extending. No indications of an early decay are discovered in any variety excepting the Cottonwood on uplands, and this will occur at any age if they are neglected. Shelter-belts are an advantage to our fruit grounds and grain fields when planted on the south side, by the protection afforded from the hot south winds.

*(South half.—By B. P. Hanan, Arlington.)*

Forest-tree planting in 1884 was successful so far as I am able to learn. Varieties used most largely for groves, Cottonwood (on account of its rapid growth and cheapness of plants), Walnut, Ash, Ash-leaved Maple, Russian Mulberry, and Catalpa (Western Hardy); for shelter-belts, Mulberry and Cottonwood; for timber-belts, Mulberry, Cottonwood, Ash, Walnut, Ash-leaved Maple, and Catalpa. Land intended for trees must be deeply plowed and pulverized, and the trees should be set a little deeper than they were grown before transplanted, in rows four feet apart each way, and well mulched, or kept well cultivated by frequent shallow plowing, to be successful. I would recommend the using of young trees of a strong one-year's growth, of all sorts except the Black Walnut, which should be buried over winter in moist earth, and planted in early spring-time. Young trees should be cut to near the collar at time of setting. I would recommend the following list as best adapted to our climate and soil, and to be preferred in the order named: Green Ash, White Ash, Black Walnut, Honey Locust, Catalpa (Western Hardy), Osage Orange, Black Locust, Ash-leaved Maple, White Maple, Cottonwood, Red Elm, Russian Mulberry. For uplands, White Ash, Green Ash, Osage Orange, Honey Locust, Catalpa, Black Locust and Russian Mulberry are preferable; for lowlands, Black Walnut, Ash-leaved Maple, Cottonwood, White Maple, Red Elm, and White Elm. Fall planting of both seeds and young trees is successful. But trees should be well mulched, or have a mound of earth thrown up around them, to make them secure against the dangers of winter. Insects are not prevalent among forest trees. Rabbits are troublesome, and trees must either be wrapped or their trunks besmeared with some offensive material, as blood, or milk and soot, to protect against their attacks. The area of forest trees is being annually extended. The Cottonwood, planted on upland, only shows a tendency to fail at from three to six-years old. Shelter-belts are an advantage to fruit grounds and grain fields, by the protection afforded to trees and growing crops from violent and hot winds.

REPUBLIC COUNTY.—By O. A. A. GARDNER, HARBINE P. O., NEB.

Forest trees planted in 1884 made a successful growth. For groves, the Cottonwood, Catalpa, Ash and White Maple were most commonly used; for shelter-belts, Cottonwood, Ash-leaved Maple, Ash, and Russian Mulberry; for timber-lots, all of the foregoing and the Black Walnut. These were planted in rows four to six feet apart and quite thickly in the row, and cultivated gradually, working the earth to the rows. Failures were generally the result of carelessness in culture or planting. I would recommend the use of young trees in preference to seed of all sorts excepting the nut-bearing varieties. Of such I would use seed. To preserve through the winter, spread them out thin on the ground and cover with straw or earth to keep them moist until spring, and then plant. Young trees should be dug in the fall, planted or "heeled in" until spring, and transplanted early. The following list of varieties is recommended for their adaptation to climate and soil, and are preferred in the order named: White Ash and Green Ash, Black Walnut, Honey Locust, Black Locust, Catalpa (Western Hardy), Ash-leaved Maple, White Maple, Red Elm, Osage Orange, White Elm, Cottonwood. For uplands, Ash, Ash-leaved Maple, Locust, Maple and Walnut are preferable; lowlands, Catalpa, Cottonwood, Osage Orange, and Elm. The same culture is necessary for both locations. Spring is generally the most favorable season for planting seeds, and autumn for young trees. Seeds such as Ash, Locust and Catalpa can be kept in sacks, hung in a dry room,

until spring. Insects are not prevalent. Rabbits are at times troublesome to forest trees, and are generally hunted with dogs. The area of forest-tree plantations is being annually extended, and no indications of early decay are discovered among any of the sorts used excepting the Cottonwood, when planted on uplands; and this generally begins when the trees are about six to ten years old. Shelter-belts are an advantage to fruit grounds and field crops, by the protection they give from sweeping winds, and forming a barrier to drifting snow, which is held on the land until melted and passed into the soil, thereby adding to the water supply needed in plant growth.

RICE COUNTY.—By R. H. DAY, LYONS.

(*North half.*)

The past spring was very favorable to tree growth, and such plantings as were properly conducted were a success. Varieties most extensively used for groves, Black Walnut, White Maple, Ash-leaved Maple, and Cottonwood; for shelter-belts, Ash-leaved Maple, Cottonwood, Black Walnut—the first of these is considered the best for such purposes; for timber-lots, Black Walnut is being the most extensively used, with some Ash and Cottonwood. I would recommend planting the seed of Black Walnut in the fall, and where they are to stand, or bedding them out, and in spring, after they have sprouted, plant in rows. Seed of Ash and Ash-leaved Maple do the best if planted in autumn, and in the place where the tree is to permanently stand. The Cottonwood propagates easily by cuttings. Many sorts other than Black Walnut may be planted and grown one year in nursery form, but should invariably be transplanted at one year old. The rows in timber-lots should be twelve feet apart, and the trees four feet apart; in shelter-belts, four feet apart each way, and when they become crowded, thinned out for wood. Land intended for such uses should be thoroughly and deeply prepared before planting. The cultivation of forest trees should be frequent during the first two or three years, and thereafter a heavy mulching is all that is needed. Forest trees, like all others, should not have their roots exposed to sun or wind, and should be kept moist, by dipping in mud, from the time they are dug until planted. It is an advantage to reduce their tops after transplanting. The following list of varieties is recommended as best adapted to climate and soil, and is preferred in the order named: Black Walnut, Catalpa (Western Hardy), Honey Locust, Ash-leaved Maple, Osage Orange, White Maple, Black Locust, Green Ash, White Ash, Cottonwood, White Elm, Red Elm. I think a great mistake is made in not planting the Osage Orange more extensively for timber. It grows rapidly, and for posts is quite as durable as the Red Cedar. In this great valley, literally speaking there are no uplands, and there can be no material difference in the results of varieties. I would recommend spring-time for planting both seed and young trees, as the autumn months are frequently attended with more or less dry weather. Insects have not been prevalent, except borers in the Green Ash. The area of forest-trees is annually increasing. There has been no tendency to early decay among the sorts used excepting the Cottonwood, and that after their cultivation ceases. Shelter-belts have been a decided advantage to orchards and field crops in the protection afforded from high winds, and a tempering of extremes of heat and cold.

(*By Dr. G. Bohrer, Chase.*)

Forest-tree planting in this portion of the county was a success in 1884. The Cottonwood and Ash-leaved Maple were most extensively used; were planted in rows from six to ten feet, and cultivated both ways. Culture is required until the trees are from five to seven years old. I prefer using young trees in planting, and not to exceed one year old. If seeds are to be used, mark off the land each way, and at the crossings drop two or more seeds. When the growth is six to eight inches high, thin out the hills to a single plant. The Black Walnut, Catalpa (Western Hardy), Green Ash and Ash-leaved Maple are No. 1



varieties for this locality. Osage Orange ranks No. 2, and Cottonwood as No. 4. The Black Locust suffers serious injury by the attacks of borers. Walnut and Ash-leaved Maple succeed on the elevated lands, while Green Ash, Elms and Cottonwood do best on lowlands. Seeds may be successfully planted in either fall or spring. To preserve them through the winter, put up in sacks when fully ripe and dry, and hang where mice cannot get at them. Spring-time is the best time for planting young trees. Insects have not been damaging to forest trees where well cultivated. The area of forest-tree plantations is annually being extended. Trees are not inclined to early decay wherever properly cultivated. Shelter-belts have been an advantage to fruit grounds and field crops, in affording protection from violent winds from both north and south.

(*South half.—By J. B. Schlichter, Sterling.*)

The planting of forest trees in 1884 was limited, but successfully done. For groves, the Catalpa, Ash, Ash-leaved Maple, Black Walnut and Cottonwood were commonly used; for shelter-belts, the Cottonwood, Russian Mulberry, Black Locust, and Ash-leaved Maple. These were planted in trenches opened for the rows running east and west, four feet apart and from two to four feet in the row, on land deeply plowed, and given thorough cultivation with a one-horse cultivator; the five-tooth is preferred. The eight-inch diamond plow does good work in very weedy land. I would recommend the use of young trees—one-year old as the best age—instead of seed, except in the case of the Black Walnut, of which seed is preferable, and should be planted where the tree is to form. It is best to sprout this seed before planting, using only such as have started their growth. The following list is recommended, and preferred in the order named: Black Walnut, Catalpa (Western Hardy), Honey Locust, White Ash, Black Locust, Ash-leaved Maple, Osage Orange, White Elm, Red Elm, White Maple, Cottonwood, Green Ash. I believe the Russian Mulberry will prove a desirable substitute for the Green Ash. Spring-time is best for planting either seed or trees; and most of the seeds may be kept through winter: Walnuts, by bedding out; Ash-leaved Maple and Ash, mixed in moist sand; and others may be kept in a dry state. Insects: Have noticed a species of tent caterpillar on Walnut trees, and a greenish worm feeding on the Cottonwood, in some instances causing a defoliation. Rabbits are not seriously troublesome to our trees. The area of forest-tree plantations is annually extending, and only the Cottonwood shows signs of an early decay, and this only when planted on the uplands. Shelter-belts are an advantage to fruit trees and field crops, when constructed on the south and west sides, by the protection afforded from winds.

RILEY COUNTY.—BY T. C. WELLS, MANHATTAN.

In this locality the Cottonwood, Black Walnut, White Maple and Ash-leaved Maple have been most extensively planted in the construction of groves, shelter-belts, and timber-lots. These have been planted in rows five to six feet apart and four feet in the row. I have always preferred young trees, not over one year old, of all classes except the Black Walnut and Oaks. For these, have used seed, and planted in autumn as soon as ripened. The roots of young trees should be well mudded at time of planting. The following list is well adapted to this climate and soil, and arranged in the order of preference: Black Walnut, Cottonwood, White Maple, Ash-leaved Maple, Red Elm, Honey Locust, Burr Oak, White Elm, and Green Ash. Black Locust is injured by borers, and hence is not recommended. The above varieties all succeed best on lowlands. Plantings made in spring are the most satisfactory in results. Insects troubling are mainly borers in Black Walnut, Ash, and newly-set Ash-leaved Maple trees, and are damaging in extent in the order named. The area of forest-tree plantations is slowly extending each year. In some groves the Cottonwood shows a tendency to fail at six to eight years old. Shelter-belts are alike beneficial to fruit grounds and grain fields in the protection afforded them from violent winds.

## RUSSELL COUNTY.—BY PROF. J. B. CORBETT, BUNKER HILL.

Forest trees planted in 1884 were a success wherever properly cultivated. For groves, the Honey Locust, Ash-leaved Maple, Cottonwood, White Ash and White Maple were largely used; for shelter-belts, Cottonwood, Honey Locust, and Ash-leaved Maple; for timber-lots, Black Walnut, Cottonwood, Honey Locust, and Osage Orange. Land selected for such purposes should be plowed early in the fall and thoroughly harrowed, and planted as early in the spring as practicable, in rows four feet apart each way. The cultivation should be about the same as required for corn, until trees are of sufficient size to shade the land between the rows. I would recommend using one-year-old trees as a rule. Walnuts do best when their seed is planted on the land where the tree is to stand permanently. Seeds of the Black Walnut, Catalpa, Honey Locust, Black Locust, Ash-leaved Maple and Osage Orange can be used quite satisfactorily in case trees cannot be had at a reasonable rate. The following list of varieties is recommended as safe to plant in this county, and preferred in the order named: Honey Locust, Black Walnut, Ash-leaved Maple, Cottonwood, White Ash, White Maple. All of these varieties succeed better on second bottom than on upland, unless the upland is very deeply prepared before the trees are planted. Thorough and frequent cultivation is of the greatest importance, and on upland mulching is valuable. Seed-planting should be done in autumn, young trees in spring. Insects: Flat-headed borers and fall web-worm have been the most injurious. To prevent the attacks of the first, wash bodies of trees with a mixture of soft soap and lime the first of May and July. Rabbits are not troublesome. During 1884, tree-planting received attention. The three preceding years were unfavorable, and very little planting was done during that period. Many groves died for want of cultivation. The Cottonwood and Ash-leaved Maple show signs of decay at six to eight years, when planted on uplands. Shelter-belts are an advantage to fruit lands and field crops when planted on the south side, by their protection from hot summer winds.

## SEDGWICK COUNTY.—BY J. G. SAMPSON, DEBBY.

The planting of forest trees has nearly ceased in this county. The Cottonwood, Ash-leaved Maple, Green Ash and Black Walnut have been most largely used for groves, and Peach trees for shelter-belts. These were planted in rows eight feet apart, and three or four feet in the row, and given good cultivation. I would not recommend the use of seed for a permanent plantation, excepting for the Black Walnut, Hickory, and Pecan; thrifty yearling trees are preferable. Land selected for forest trees should have a good preparation before being planted. The Black Walnut, Green Ash, White Maple, Ash-leaved Maple and White Ash are suitable kinds, and are preferred in the order named. I consider the Catalpa (Western Hardy) another "White Willow" humbug. Suited to uplands, Ash, Black Walnut, and Ash-leaved Maple; to lowlands, Ash, Black Walnut, Honey Locust, White Maple, and the Cottonwood—if it has any value after grown. Spring-time is the most favorable season for planting young trees or seeds. The latter can be kept through winter in a dry, cool place. Insects are not seriously damaging, nor are rabbits, to forest trees in this locality. I have not been able to discover a tendency to early decay, only among Cottonwood trees, and that when planted on uplands: it begins at from six to ten years. Shelter-belts are an advantage to fruit grounds, if not too densely formed.

## SHAWNEE COUNTY.—BY H. W. LIPP, ROSSVILLE.

(*North of Kansas River.*)

The forest trees planted in 1884 made a successful growth. Ash-leaved Maple, White Maple, Cottonwood, Black Walnut, Catalpa, White Elm and Red Elm were most generally used. These were planted in rows twelve to sixteen feet apart, and eight to sixteen feet in the row. I would advise the planting and growing of corn between the rows

each year, until it becomes impracticable, and then sow the land to some tame grass. Young trees, one to two years old, are preferable to seed for such plantations. The following list of varieties is suited to the climate and soil, and preferred in the order named: Black Walnut, Ash-leaved Maple, White Maple, Cottonwood, Honey Locust, White Elm, Red Elm, Catalpa. For some reason the Ash has not succeeded here. The Osage Orange has not been tried for any other purpose than a hedge. The Black Locust is condemned because of its liability to attacks of borers. For uplands I would recommend the Catalpa, Ash-leaved Maple, White Maple, Honey Locust, White Elm, Red Elm, and Black Walnut; for lowlands, Black Walnut, Ash-leaved Maple, White Maple, Cottonwood, Honey Locust, Catalpa, White Elm, and Red Elm. Fall is the most favorable season for seed-planting, and spring for young trees. Seeds, however, can be safely kept until spring by mixing them with dry sand, packing in boxes, and burying the box in the ground, protected from mice. Insects: The borer is the only one that troubles forest trees here; and as a protection, wash trees with a mixture of soft soap and a small quantity of carbolic acid. Good cultivation also is recommended. To protect trees from rabbits, washing the bodies with a mixture of blood and sulphur is reliable. The area of forest-tree plantation is annually extended by the planting of groves and shelter-belts. No signs of early decay have yet developed, excepting among Cottonwoods and Lombardy Poplars, planted on uplands. Shelter-belts are an advantage to orchards, by the protection given from high winds.

*(South of Kansas River.—By J. G. Clark, Waveland.)*

Forest trees planted in 1884 were a success. Varieties of trees most extensively used for groves, Black Walnut, Maples, and Elms; for belts or shelters, Osage Orange, Red Cedar, Hackberry, and Mulberry; for timber-lots, Black Walnut, Red Cedar, Ash, Hackberry, Red Elm, Hickory. These were planted in rows four feet apart and two feet in the row, and cultivated with a fine-tooth cultivator sufficiently to keep the plantation free of weeds. Failures are mainly due to neglect, such as recklessness in culture, and permitting stock to range among them. I would recommend planters to use seed of all nut-bearing sorts, and one-year-old trees for other kinds. I would recommend the following list of varieties as adapted to climate and soil, and preferred in the order named: Black Walnut, Honey Locust, Catalpa (Western Hardy), White Ash, Green Ash, Osage Orange, Ash-leaved Maple, Red Elm, White Elm, Hackberry, White Maple, Mulberry. I object to the Cottonwood, it being short-lived, and having little value when grown; and to the Black Locust, because of its being seriously injured by borers. For uplands I would use Black Walnut, Honey Locust, Catalpa, White Ash, Green Ash, Osage Orange, Ash-leaved Maple, and Mulberry; for lowlands, Red Elm, White Elm, Hackberry, and White Maple. Autumn is the most favorable season for planting seeds, and spring for young trees. Insects: Black Locust and Cottonwoods suffer from attacks of borers; therefore I advise planters to discontinue their use. The rest of the list is comparatively free from attacks of insects. Rabbits are troublesome, and are hunted and killed. The area of forest-tree plantations is annually extending. Tendency to early decay is noticeable among the Cottonwood and Mulberry, where planted on uplands; on lowlands at from five to ten years of age. Shelter-belts are an advantage to fruit grounds and field crops, in the protection afforded from violent winds.

SHERIDAN COUNTY.—By S. P. DAVIDSON, MCGREGOR.

Forest-tree planting was a success in 1884. Cuttings and seeds made a good growth. Cottonwood, Ash and Elm were most extensively used; were planted in rows six feet apart, and cultivated with crops between rows. I would recommend the use of one-year-old trees; plant in deep holes, and use freely of stubble manure around them. Green Ash, Ash-leaved Maple, Osage Orange, Cottonwood and Red Elm all did well;

Catalpa, White Ash, and White Maple, fairly well. The Ash and Elm succeed on our uplands, but the others in the list should be planted on bottom lands. Autumn is generally considered the preferable season in which to plant seeds or young trees. Rabbits are troublesome, and compel us to wrap the bodies of trees with paper or cloth. The area of forest-tree plantations is being annually extended. Shelter-belts have been beneficial.

SMITH COUNTY.—By C. J. HOLMES, GAYLORD.

(*South half.*)

The planting of forest trees in 1884 was successful. Black Walnut, Honey Locust and Ash were most generally used. These were planted in rows eight feet apart and four feet in the row, and cultivated sufficiently to keep weeds down and the land in loose condition. I would recommend using one-year-old trees for such purposes. List of varieties recommended as adapted to this location, and preferred in the order named: Honey Locust, Black Walnut, Catalpa (Western Hardy), White Ash, White Elm, Ash-leaved Maple, Osage Orange, Black Locust, Cottonwood, Red Elm, White Maple. Spring-time is the most favorable season for planting young trees. Their roots should be kept moist and protected from the sun while the work is being done. Insects have not been prevalent. Rabbits are troublesome, compelling planters to wrap their trees for protection. The area of forest-tree plantations is annually extended. No indications of early decay are discovered, except among Cottonwoods planted on uplands. Shelter-belts are an advantage to fruit grounds, when constructed on the south side.

(*North half.*—By Jeremiah Rhodes, Smith Center.)

Forest trees planted in 1884 were a success, so far as I can learn. For groves, Cottonwood, Black Walnut, Ash and Catalpa were generally used; for shelter-belts, Honey Locust, Ash, and Black Walnut; for timber-lots, Honey Locust, Black Walnut, and Cottonwood. For groves and timber-lots, trees were set in rows six feet apart, and for shelter-belts two feet in the row, and the land heavily mulched to keep weeds down and preserve the moisture. In the construction of the plantations, I would use young trees of all kinds, excepting of those which naturally form a long tap-root; of such, seed are preferable. All kinds of seeds need freezing to aid them in breaking the shell for germination, except the Locust, which should be well scalded. Trees can be most easily grown from seed planted in nursery form, excepting the Black Walnut. One-year-old trees are preferable for transplanting, to those of any other age; do best if planted in spring-time. Seeds do best when planted in autumn. I would recommend the following list as adapted to the climate and soil, and preferred in the order named: Black Walnut, Black Locust, Honey Locust, White Ash, Catalpa, White Elm, Red Elm, White Maple, Cottonwood, Ash-leaved Maple. Suited to uplands, Black Walnut, Black Locust, Honey Locust, Ash, and Catalpa. But few kinds do well on upland. For lowlands, the above list as recommended. Upland plantations do best when mulched. Insects: Borers injure the Cottonwood and Ash-leaved Maple, and a green worm feeds on the Cottonwood leaves. If trees are kept cleanly cultivated, insect injuries are largely prevented. Rabbits are troublesome, and I know no better prevention to their attacks than to exterminate them. There is a tendency to early decay of forest trees on some uplands, while on others they are thriving. Honey Locust and Black Locust are hardy in such places. Shelter-belts are an advantage to fruit and field crops, in the protection given from damaging winds.

STAFFORD COUNTY.—By NELSON NICKERSON, SANDAGO.

(*North half.*)

Forest-tree planting in this section was a success in 1884. For groves, the Cottonwood; shelter-belts, Cottonwood and Ash-leaved Maple; for timber-lots, Cottonwood,

Catalpa (Western Hardy) and Black Walnut were most extensively used. Land selected for such purposes should be plowed in the fall, listed and planted in the spring. One-year-old trees are preferable. Plant deep, in rows twelve feet apart each way; cultivate by plowing and harrowing level between the rows, to prevent water from running off. Mulching during the latter part of the season is advisable. I would recommend the following-named varieties for culture in this locality, and preferred in the order named: Catalpa, Cottonwood, Black Walnut, Red Elm, White Maple, White Ash, Osage Orange, Green Ash, Honey Locust, Black Locust. For upland, Catalpa, Cottonwood, Black Walnut, White Maple, Osage Orange, Honey Locust, Black Locust; for lowlands, Red Elm, White Ash, and Green Ash. Autumn is the most favorable season for seed-planting, and early spring for young trees. Insects are not prevalent in this locality, and rabbits are not numerous. The area of forest-tree plantations is extending in this county. Shelter-belts are an advantage to fruit grounds and field crops in their protection from high winds.

(*South half.—By J. C. Stone, Freeman.*)

The planting of forest trees in this locality was a success in 1884, and was composed mostly of Cottonwood and Black Walnut. These were set on deeply-prepared land, in rows six to eight feet apart and from one to two feet in the row, and given such cultivation as is required to grow corn. I would recommend the use of young trees, one or two years old, in all plantations excepting of the Black Walnut and the class of seeds needing freezing, which are most successful when seed is used. Cottonwood trees can be grown easily from cuttings. I would recommend as a safe list to plant, Black Walnut, Cottonwood, Ash-leaved Maple, Catalpa, White Ash, and Osage Orange. The same culture is suited to both upland and lowland plantations. Planting may safely be done either in autumn or spring-time, in this county. Insects are not prevalent, and I have heard no complaints of the ravages of rabbits. The area of forest-tree plantations is annually being extended. In the years 1879, '80 and '81, Cottonwoods died out largely, on account of the weather, but since then they have been quite a success, even on uplands. Shelter-belts are an advantage to fruit grounds, by the protection given from violent winds.

(*South half.—By C. G. McNeil, Stafford.*)

Forest trees planted in this locality made a successful growth in 1884. Varieties most generally used for groves, Cottonwood, Black Walnut, and Ash-leaved Maple; for shelter-belts, Cottonwood. [Observation and experience teach that it is folly to plant this variety in any location where water cannot be reached within ten feet of the surface of the ground.—McNEIL.] For timber-lots, Ash-leaved Maple, Black Walnut, Mulberry and Ash—each of which is hardy. For seeds, prepare the land in fall by subsoiling if practicable; list in rows, and plant shallow; follow nature's methods as nearly as possible. Plant in rows four feet apart each way, and thin out the trees as their growth requires, each year. I would use seeds in the formation of timber-lots, giving them thorough cultivation, and after the second year mulch, to smother out weed growth. Seeds do the best if planted as soon as they ripen. If young trees are to be used, then plant in fall or early spring, on fall-prepared land. I would recommend the following varieties as *good*: Black Walnut, Catalpa, White Ash, Green Ash, Osage Orange, Red Elm, White Maple; as *fairly good*, Honey Locust and Black Locust; *very good*, Ash-leaved Maple. For upland, Black Walnut, Catalpa, Ash-leaved Maple, White Ash, Green Ash, Osage Orange, Black Locust, Russian Mulberry; for lowlands, Honey Locust, Cottonwood, White Elm, Red Elm, and White Maple. For either location deep and thorough preparation of the land and clean culture of trees are necessary. Seeds can be kept over winter by mixing them with earth, either in boxes or trenches. If in boxes, care must be given that water can pass off. Insects are not prevalent; rabbits are

troublesome. Trees are protected from the ravages of rabbits by smearing their bodies with blood. The area of forest-tree plantations is being annually extended. No signs of a tendency to early decay have been discovered except among Cottonwood trees, and then when planted on uplands only. Shelter-belts are an advantage to fruit grounds and field crops, by the protection they afford from winds during the summer, thereby tempering the atmosphere, retarding evaporation of moisture, and preventing the plants from being whipped around.

SUMNER COUNTY.—By H. C. ST. CLAIR, BELLE PLAINE.

(*North half.*)

The planting of forest trees in 1884 was a success. Varieties most extensively used for groves, shelter-belts and timber-lots, were Cottonwood, Black Walnut, Ash, Maple, Catalpa, Ash-leaved Maple, and Elm. Land selected for such purposes should be thoroughly prepared, and trees planted early in the spring, in rows sixteen feet apart and four feet in the row. Cultivate the spaces between with a crop of corn or potatoes each year, until the trees will shade the land; then sow to orchard grass. I would recommend the using of young trees, one-year-old, of all kinds except Black Walnut, of which use seed, prepared by sprouting it in a seed-bed, which is done by spreading the nuts in a thin layer on the ground, and covering with earth three or four inches deep, in the fall. In this condition let them remain until they begin to show sprouts in the spring; then plant at once. Other seed do best when grown in nursery rows for one year, and then transplanted. It is a good practice to dig such young trees in the fall, and heel in during winter, as they will then be ready when wanted. I would recommend the following list of varieties as best suited to our climate and soil, and preferred in the order named: Cottonwood, Ash-leaved Maple, Black Walnut, Hard Ash, White Elm, Black Locust, Osage Orange, Honey Locust. These varieties are all suitable for lowlands; and, with the exception of the Cottonwood, to our uplands. All seeds do best if planted as soon as ripened. Spring is most favorable to tree-planting. Insects: Grubs injure the Cottonwoods, and a worm feeds on the leaves of Maples. Rabbits are troublesome to forest trees. To protect them from their ravages, wrap the bodies with straw or corn-stalks. Cottonwood trees planted on upland begin to fail whenever cultivation or mulching is abandoned. Shelter-belts are an advantage to fruit-grounds, by the protection given from winds.

(*South half.*—By L. A. Simmons, Wellington.)

Forest trees planted in 1884 made a successful growth. For groves, the Catalpa, White Maple, Black Locust and Black Walnut were most extensively used; for shelter-belts, same as for groves, and some Russian Mulberry, Red Cedar, and seedling Peach trees; for timber-lots, Cottonwood, Black Walnut, Catalpa, Black Locust, and Pecan. These were planted in rows eight feet apart each way, and the spaces between planted to corn. I would recommend using young trees—yearlings—of all kinds except Black Walnut and Pecan; of these, use seed, which should be preserved through winter in a seed-bed, and planted in spring. I would recommend the following varieties as best adapted to our climate and soil, and preferred in the order named: Catalpa (Western Hardy), Black Locust, Black Walnut, Red Elm, Honey Locust, Ash-leaved Maple, Green Ash, Cottonwood, Osage Orange, White Elm, Red Elm. The Catalpa and Black Walnut are suitable for uplands, and Black Walnut, Cottonwood and Ash-leaved Maple for lowlands. Spring is the most favorable season for planting either trees or seed. The latter can be preserved in seed-bed until spring. Insects are prevalent; caterpillars are most injurious. These are easily destroyed by pushing a burning torch of kerosene into their nests. Rabbits are very troublesome. To protect the trees from their ravages, wrap the bodies with building paper or corn-stalks. The area of forest-tree plantations

is annually extended. Shelter-belts are an advantage to fruit grounds and grain fields, in the protection afforded from storms and hot winds.

TREGO COUNTY.—By W. B. KRITCHFIELD, WAKEENEY.

Forest trees planted in 1884 made a successful growth. Ash-leaved Maple, White Ash, Osage Orange, Elm, Black Locust, Catalpa, Black Walnut and a few Honey Locust were generally used. These were planted in rows eight to ten feet each way, and well cultivated. Mulching is desirable. I would most decidedly recommend planters to use young trees in preference to seed. The following list of varieties is safe for this county, and preferred in the order named: Catalpa (Western Hardy), White Ash, Osage Orange, Ash-leaved Maple, White Elm, Black Locust, Honey Locust, Black Walnut, Red Elm. Walnut and Maple are most reliable, while the Cottonwood is most unreliable and short-lived. For upland, Catalpa, Ash, Ash-leaved Maple, and Red Elm; for lowlands, Cottonwood, White Elm, and White Maple. Spring is the most favorable season for planting either trees or seeds. The nut-bearing kinds should be planted in fall. Insects have not been prevalent. Rabbits have troubled some at times. Trees must be wrapped, to protect from such liabilities.

WABAUNSEE COUNTY.—By H. A. STILES, PAVILION.

The planting of forest trees in the county has not been extensive. For groves, the Catalpa, Black Walnut, Kentucky Coffee Tree, Red Elm and Cottonwood are most generally used; for shelter-belts, Cottonwood, Red Cedar, Mulberry, and White Maple; for timber-lots, Black Walnut, Catalpa, and Kentucky Coffee Tree. Land for such purposes should be well plowed and pulverized before planted. Young trees of all classes are preferable to seed, excepting the Black Walnut, for which the nuts are used. Set in rows six feet apart and four feet in the row. Good cultivation is as important to success as for a corn crop, and especially during the first year, as trees seldom survive without it. Failures are mainly due to inattention to details in planting. It is advisable to plant seeds in nursery rows, excepting the Black Walnut, which should be planted in permanent places and cultivated one year, and then transplanted to lands devoted to permanent growth. The following list of varieties is recommended for their adaptation to climate and soil, and preferred in the order named: Black Walnut, Catalpa (Western Hardy), Kentucky Coffee Tree, White Ash, Green Ash, Ash-leaved Maple, Osage Orange, Red Elm, White Elm, White Maple, Black Locust. For upland, Osage Orange, Black Locust, Black Walnut, and Catalpa; for lowlands, the entire list, except Osage Orange and Black Locust. Thorough cultivation is as important on lowlands as on uplands. Spring planting is most successful for seeds or young trees. Seeds can be safely carried through winter, by mixing them with sand or dirt, kept slightly moist, and exposed to freezing. Insects: There are none troubling forest trees, excepting borers in the Black Locust. Rabbits are troublesome. For protection, besmear the trees with blood. A tendency to early decay is discovered in Cottonwood trees planted on uplands, at eight to ten years of age. Shelter-belts are an advantage to fruit grounds and grain fields, by the protection given from heavy winds, which force the plants from a natural position and hasten evaporation of moisture.

WASHINGTON COUNTY.—By DR. CHAS. WILLIAMSON, WASHINGTON.

All classes of forest trees planted in 1884 made a successful growth. For groves, Black Walnut, Ash-leaved Maple, Honey Locust, Cottonwood, and Russian Mulberry; for shelter-belts, Willow and Cottonwood; for timber-lots, Black Walnut, Ash, Hackberry, White Maple, Honey Locust, Cottonwood, Russian Mulberry, Oaks, White Walnut (or Butternut), were most extensively used. These were planted in rows six feet

apart, and given cultivation similar to that required for corn. I would recommend the using of seed whenever practicable. If young trees are used, one-year-olds are preferable. The following list is recommended in the order named, as suited to our climate and soils: Black Walnut, Honey Locust, White Ash, Red Elm, Green Ash, Catalpa (Western Hardy), Ash-leaved Maple, White Elm, Osage Orange, Cottonwood, White Maple, Black Locust. For upland, the following varieties are successful: Black Walnut, Ash-leaved Maple, Cottonwood, Mulberry, Catalpa, and Honey Locust. The culture required for either upland or lowland is the same. Autumn is the most favorable season for seed-planting, and spring for young trees; but these should be dug in fall and heeled in during winter. Insects: Borers attack Black Locust and Maple trees, and are about the only noxious species known in the county as infesting forest-tree plantations. It is a noticeable fact, that trees grown from seed planted where they are to permanently remain are not so liable to these insect attacks as where they have been transplanted. Rabbits are a nuisance which can only be checked by their extermination. Trees are not safe unless protected by wrapping the bodies. The area of forest-tree plantations is annually being extended, and no indications of an early decay have been noticed. Shelter-belts are alike an advantage to fruit plantations and grain fields, by the protection given from effects of winds. The crops on such farms are increased to fully one-third more than those grown without.

WOODSON COUNTY.—BY W. W. SMITH, NEOSHO FALLS.

Forest trees planted in 1884 made a successful growth. The varieties most extensively used were, for groves and timber-lots, Maple, Walnut, Cottonwood, Elm, Ash, Ash-leaved Maple, and Locust, all of which are found growing in our native forests. Planting is generally made in rows eight feet apart, and at different distances in the row, according to nature of varieties used and notions of the planter. Cultivation should be thoroughly done each year until the trees become established in a thrifty growth, and shade the land. I would recommend the use of young trees of the slow-growing sorts, and seed of rapid growers. If seed, plant as soon as ripened. The Cottonwood and White Maple ripen their seed early, and must be used at once. Other seeds may be preserved until spring, in dry, cool places. Nuts should be bedded in the earth until spring, or planted at once. Trees may be dug in fall, heeled in, and planted in spring. List of varieties recommended as well suited to our climate and soil: Black Walnut, Catalpa (Western Hardy), Honey Locust, White Ash, Green Ash, Box Elder, Osage, Cottonwood, White Elm, Red Elm, White Maple, Black Locust. The Black Locust is invariably destroyed by borers before the trees are eight years old. All the varieties in the above list are good. I would add the Ailantus; it is hardy, stands drouth and cold, is easily propagated, a rapid grower, and its wood is said to be durable. The list is suited to lowlands; while Black Locust, Black Walnut, Maple and Ailantus succeed on uplands. I would recommend spring-time as the most favorable for planting seeds or young trees. Insects are not prevalent, nor are rabbits seriously troublesome. Shooting and trapping of the latter are the surest means for protection. The area of forest-tree plantations is annually extended, though not largely. Shelter-belts are an advantage to fruit grounds and grain fields alike, in the protection given from hot, drying southwest winds.



## COUNTY REPORTS FOR 1884.

These reports are compiled from the following circular. (NOTE.—All synonyms have been rejected, and the nomenclature arranged to conform to the published catalogue of the American Pomological Society, and Downing's "Fruits and Fruit Trees of America."—SEC'Y.)

[Circular No. 1, 1884.]

SECRETARY'S OFFICE, KANSAS STATE HORTICULTURAL SOCIETY, }  
LAWRENCE, KAS., November 13, 1884.

DEAR SIR: The President of this Society instructs me to tender you the appointment of Vice President for your county for the year 1884, and respectfully requests you to accept and perform the duties of the office, as defined in the following article of the Constitution of the Society:

"ARTICLE VII. There shall be a Vice President annually appointed in each county in the State, whose duty it shall be to organize local horticultural societies in their respective counties whenever practicable, to report to each annual meeting on the general subject of horticulture, and to look after the interests of horticulture in their respective localities."

Article III of the Constitution was amended at the Thirteenth Annual Meeting, as follows:

"Any person who, under the appointment of the President, shall perform the duties of a County Vice President for one year, shall be enrolled an annual member for that year; and in consideration of such services for ten years, shall be enrolled a life member, and entitled to all the privileges of such membership."

The following questions are suggested by this office as important for consideration in making up your report for the year 1884. Any other matter coming under your observation and of interest to the horticulturist should be included, and will be carefully considered.

At the Seventeenth Annual Meeting of the Society, held at Ottawa, December 5-7, 1883, the Secretary was requested to urge upon the attention of the Vice Presidents in unorganized counties a consideration of the advantages and importance of a horticultural society to their respective counties, and to the State, as suggested and made a part of their duty in Art. VII of the Constitution, given above.

Respectfully asking your prompt attention to the matter of this circular, I am

Very truly yours,

G. C. BRACKETT, *Secretary.*

### QUESTIONS.

#### FRUITS.

##### ORCHARDS.—(*Embracing Apple, Peach, Pear, Plum, and Cherry.*)

1. Have orchard trees made a vigorous and healthy growth? Apple, peach, pear, plum, cherry.
2. What was the crop in quantity, considering the nature of varieties? Apple, peach, pear, plum, cherry.
3. What the quality, compared with preceding years? Apple, peach, pear, plum, cherry.
4. What the condition of trees on Dec. 1st, 1884? Apple, peach, pear, plum, cherry.
5. What diseases developed among the trees? Apple, peach, pear, plum, cherry.
6. What remedies have been successfully used?
7. Have insects injurious to trees been prevalent?
8. What means used for their extermination?
9. Have insects injurious to the fruit been prevalent?
10. What means used to prevent their attacks, or to exterminate them?
11. Was the planting of orchard trees extensive in the spring and autumn of 1884? Apple, peach, pear, plum, cherry.
12. What per cent. in loss occurred to the spring planting, and probable cause?
13. From results, which season is preferable for planting—Spring? Autumn?
14. What new or recently introduced varieties have been planted? Apple, peach, pear, plum, cherry.
15. Have any of the varieties of Russian fruits been planted? Apple, apricot.
16. Have they been a success?
17. Kieffer pear. What have been the results with the tree? Has it fruited? What is the character of the fruit? Do you feel warranted in recommending its planting?

18. LeConte pear. Please answer the questions asked concerning the Kieffer respecting this variety.

19. Have the trees of these two varieties shown any disposition to blight?

20. What the present age of the oldest trees, Kieffer and LeConte, planted in your county?

21. Does the blight attack any varieties planted on your ground? If so, which varieties are the least liable? Name in the order of liability, and state whether dwarfs or standards.

22. What the comparative result between upland and bottom-land apple orchards in 1884? 1. Quantity of product. 2. Quality of product.

23. Which location, upland or bottom, estimating the product of years prior to 1884, has been the more profitable?

24. Has the pursuit of orcharding been a profitable investment in the hands of careful management? Apple, peach, pear, plum, cherry.

25. Would you advise the investment of labor and capital in the pursuit for—1. Family purposes? 2. Commercial purposes?

26. If not profitable in your county, please state the causes hindering, in your opinion, based on experience and observations.

#### VINEYARDS.

27. Have you any recommendations to offer as to the most suitable—1. Location? 2. Varieties preferable? 3. Time and method of planting? 4. System of culture and management?

28. Have any of the newer varieties proven valuable acquisitions to the established list for the State, or as substitutes for any therein?

#### SMALL FRUITS.

(Embracing Blackberry, Currant, Gooseberry, Raspberry, and Strawberry.)

29. What are your conclusions, based on the experience of the past and present year, as to the success of the culture of blackberries, currants, gooseberries, raspberries, strawberries?

30. What recommendations do you offer as to—1. Location? 2. Varieties? 3. Culture?

31. Have you fruited the following varieties, and do the results satisfy you as to plant and fruit? *Blackberries*—Early Harvest, Early Cluster, Snyder. *Currants*—Fay's Prolific, Lee's Prolific. *Raspberries*—Hansell, Souhegan, Shaffer's Colossal. *Strawberries*—Jas. Vick, Manchester, Big Bob, Atlantic, Mrs. Garfield, Old Ironclad, Indiana, Daniel Boone, Finch, Piper.

32. What the condition of small-fruit plantations on December 1, 1884? Blackberry, currant, gooseberry, raspberry, strawberry.

33. Is the quince succeeding in your county?

34. What treatment do you give it, and what kind of soil used for its culture?

#### GARDEN VEGETABLES.

35. Please name varieties of the different classes which succeed in your county. 1. Extra-early crop. 2. Second-early crop. 3. General crop.

#### MISCELLANEOUS.

36. Is there a general confidence in fruit culture?

37. Are farmers generally planting for family supply of fruit?

38. Is there a general disposition to plant shade and ornamental trees, flowering shrubs and plants to adorn the home surroundings?

39. What is the present condition of the district school-house yards in your county, and what proportion are provided with shade trees in healthy condition?

NOTE—Please give this circular your prompt attention, and return, filled out, by December 10, 1884.

Very truly, &c.,

G. C. BRACKETT, Secretary.

## NORTHERN FRUIT DISTRICT.

ATCHISON COUNTY.—BY THOMAS F. COOK, MONROVIA.

Fruits: Apple, peach, plum and cherry trees made a vigorous and healthy growth. The pear failed. Considering the nature of varieties, the product of apples, pears and plums was fair in quantity, while the peach failed, and the cherry produced well. The quality of apples, pears, and plums, as compared with preceding years, was about the same; that of cherries better. The condition of trees December 1st, 1884, was good of all classes. No new disease developed among the trees during the past year. Of insects, the round and flat-headed species of borers were prevalent, as in preceding years. These

were exterminated by the use of knife and probe. The fruit was not damaged by insects to as great an extent as that of the previous year. The extent of the planting of orchard trees in the spring and autumn of 1884 did not exceed that of the previous year, and the loss was less than usual, owing to the favorable season. Spring-time is preferable for the planting of fruit trees. Of new varieties of pears, the Kieffer and LeConte were planted two years ago, and have not been attacked by the blight. Of Russian varieties of apples which have been planted, only the old-established sorts have been successful; the Red Astrachan and Duchess of Oldenburg especially favored. Pear blight: The Bartlett is the least liable to attacks of this disease. As to location of planting, as between upland and bottom, the latter—having a northern slope—afforded the most satisfactory results the past season. Apple, plum and cherry orchards have been profitable investments in the hands of careful managers, while the peach and pear have failed. Vineyards: The Concord is the most preferable variety, and should be planted in the spring of the year, upon well-prepared ground, in rows six feet apart each way, thoroughly cultivated until the middle of July, and trained to a wire trellis. A high, rolling location is most desirable. Small fruits: Blackberries, currants, raspberries, and strawberries, where well cultivated, have yielded a profitable crop, while gooseberries have not. All classes should be planted on high, rolling ground, and well cultivated during the season. The Snyder blackberry has been a success in fruiting, but it is inferior in quality. The condition of small-fruit plantations on December 1st, 1884, was good of all classes. Miscellaneous: There is a general confidence in fruit culture, and farmers are generally planting for family supply, and adorning their homes with shade and ornamental trees, flowering shrubs and plants. Very few of the school-house yards are provided with either shade or ornamentation.

BROWN COUNTY.—BY R. C. CHASE, HIAWATHA.

Fruits: Orchard trees of all classes made a vigorous and healthy growth the past season. The crop of apples, pears and cherries was an average of other seasons, while the peach was a failure, and the plum very light. In quality, compared with preceding years, the apple, pear and cherry was as good, the plum inferior. The condition of trees on December 1st, 1884, was good of all classes. No new diseases developed among them, and the blight was not so severe among pear trees. The remedy used is to remove the blighted parts as soon as discovered to be affected. Insects injurious to the tree were not more prevalent than usual, and such as attack the fruit not as prevalent as in some preceding years. The planting of orchard trees the past season was about an average with other years, which was extensive, excepting of pears. The loss in planting was slight, and was caused by loss of root in digging, and careless handling. Most varieties of fruit trees should be planted in spring. Apples, however, succeed quite well planted in the fall. Of the Russian varieties of fruit, the Duchess of Oldenburg, Red Astrachan, and some others were planted; but the high price required in the purchase of other kinds prevented many from planting. The Kieffer pear has been extolled beyond its merits, and I would advise new planters to be cautious of planting it. The same advice is given regarding the LeConte. A few of these varieties were planted four years ago, and so far have escaped the attacks of the blight. Apple orchards planted on uplands afforded the finest product in quantity and quality the past season. Investments in apple, plum and cherry orchards have been profitable, while in the peach and pear they have not. With pears, the blight generally destroys the trees before they have borne enough to repay the expense of cultivation. Vineyards: A hillside location, sloping to the east, is the most desirable. Plant the vines in rows, six feet apart. The varieties preferable are the Concord, Agawam, Martha, and Delaware. Small fruits: Blackberries of the right varieties can be grown on any soil in this county. Currants succeed when protected during the months of July and August. Gooseberries have not been successful. Raspberries suc-

ceed, but the strawberry requires too much care to be a profitable crop. Of new varieties of small fruits, the Early Harvest blackberry fruited, but does not give satisfaction. The Snyder is a success in this locality. Fay's Prolific currant succeeds, and is a fine variety. Of new varieties of strawberries, satisfactory results are reported with the James Vick, and Old Ironclad. The condition of small-fruit plantations on December 1st, 1884, was good of all classes. Garden vegetables—recommended list: Early corn, Minnesota; cucumbers, Early Cluster; cabbage, Early Winningstadt, Jersey Wakefield, Henderson's Early; beets, Early Bassano, Egyptian; peas, Tom Thumb. Miscellaneous: There is a general confidence in fruit culture in this county, and farmers are generally planting in quantity to afford family supplies. There is a general disposition to plant shade and ornamental trees, and flowering shrubs and plants, to adorn the home surroundings, and an increasing interest among the people to provide their school yards with shade trees. Fifteen years ago there was but one school-house yard in the county in which any attempt had been made to ornament the grounds. Now fully one-half are set to trees, and a number of them are laid out with flower beds, etc., for ornamentation.

CLAY COUNTY.—BY A. R. KEELER, CLAY CENTER.

Fruits: Orchard trees of all classes made a vigorous and healthy growth. Considering the nature of varieties, the crop of apples and cherries was, in quantity, fair; peaches, none; pears, 50 per cent.; plums, 40 per cent. of an average crop. The quality of apples and cherries, compared with preceding years, was very good; pears and plums, good. The condition of trees on December 1st, 1884, was good of all classes, no diseases having developed among them. The planting of orchard trees during the season of 1884 was very extensive of apples, light of peaches, and moderate of pears and plums. The percentage of loss in these plantings was very light, and occasioned more from want of care than from any other cause. Spring-time is considered the most favorable for planting. Kieffer and LeConte pear have been planted, but not sufficiently tried to determine their character. Neither of these has shown any disposition to blight. The past season the product of apple orchards planted on upland and bottom, was larger on the upland; in quality very little difference was found. But upland locations have generally been the most profitable. The pursuit of apple orcharding has been a very profitable investment; of peaches it has not; all other classes have been quite so. Small fruits: Blackberries have not been successful; of currants, the Red Dutch is the only variety that succeeds here; gooseberries and raspberries have generally succeeded, while strawberries have been rather fickle. The condition of small-fruit plantations on December 1st, 1884, was very good of all classes. Miscellaneous: There is a general confidence in fruit culture, and farmers are generally planting for family supplies. There is a general disposition to plant shade trees, and flowering plants and shrubs to adorn the home surroundings. The condition of school-house yards is not very flattering.

CLOUD COUNTY.—BY VAN E. BUTLER, DELPHOS.

(*North half.*)

Fruits: The growth of fruit trees in 1884 was the largest known in this county for years. The crop of fruit was heavy, and quality equal or better than in preceding years. Condition of trees on December 1st, 1884, good. No diseases developed except the curled-leaf on peaches. Insects injurious to trees were prevalent. As a means for extermination, some have used washes. I have found a sharp knife, well handled, the best means. Injurious to the fruit, the codling moth and curculio. All classes of fruit trees were extensively planted the past season, except the peach, and with very little loss. From past results, spring is the most favorable season for planting. Of the Russian fruits, only a few

of the old standard sort, Duchess of Oldenburg, have been successfully fruited. Kieffer pear trees are looking finely, but not yet fruited. LeConte has also been planted to a considerable extent. Neither of these shows a tendency to blight. I have trees of Bartlett, Clapp's Favorite, Seckel — these are standards. I have the Bartlett worked as a dwarf in fine condition. Not a case of blight has appeared on my grounds, nor do I believe it has in the county. Apple orchards planted on second-bottom land produced the heaviest crops of best quality in 1884, as well as in years preceding. All classes of orchards, except the peach, have been profitable; and I would advise planting for family and commercial purposes where marketing facilities are obtainable. Failures are the result of ignorance and swindling tree agents. Vineyards: Locations ranging from second-bottom lands to high elevations, are preferable. I would plant in spring, on thoroughly prepared land, give clean and thorough cultivation, and train to stakes. The Concord, Dracut Amber and Martha are the most profitable varieties; have succeeded with the Delaware. Small fruits: All classes are successfully grown, the currant only requiring special conditions. New varieties: Snyder blackberry is the best sort; Jas. Vick, Manchester and Big Bob have fruited, and I am quite well pleased with them. The condition of most of the small-fruit plantations on December 1st, 1884, was promising of all classes. The quince is succeeding finely, planted on sandy land and mulched. Miscellaneous: There is a general confidence among our farmers in fruit-growing, and many are planting for family supply of fruit and surrounding their homes with shade, ornamental trees, and flowering shrubs. Very few of the school-house yards in the county are provided with shade trees.

(*South half.—By C. H. Sheffield, Delphos.*)

Fruit: All classes of orchard trees made a vigorous and healthy growth the past year. The crop in quantity, considering the nature of varieties, was, of apples, the best ever grown here; peaches, very light; pears and cherries, very good; plums, fair. The quality of apples, compared with preceding years, was better; pears, excellent; plums, very fine, and cherries good. The condition of apple, pear and cherry trees, on December 1st, 1884, was splendid; peach and plum only good. Insects injurious to trees were not prevalent, and only the codling moth was found injuring the fruit. The planting of orchard trees in the season of 1884 was more largely than ever before of apples, very light of peaches, pears, and plums, but more extensive of cherries. The loss occurring to these plantings was very light. Spring-time has been considered preferable for planting. Of the Russian fruits, but very few of the apples have been planted, but they have been successful. The Kieffer and LeConte pear have been planted in small quantities, but have not as yet fruited, and I can give them no recommendation. Blight has not yet developed among the pear trees in this county. The results of comparison between the upland and bottom-land apple orchards, in 1884, were in favor of the bottom land as to quantity, but the upland as to quality. The pursuit of orcharding has been decidedly profitable, and I would advise the investment of labor and capital in the pursuit, for family and commercial purposes. Vineyards: Any rich soil that will produce good corn would be a suitable location for vines. Would recommend planting in spring, and in rows eight feet apart, running north and south, trained on a trellis. Varieties preferable are Moore's Early; for a general crop the Concord. Small fruits: Of blackberries, the Snyder has been profitable. Currants can be raised as easily as corn, with proper culture and heavy mulching, planting on the north side of some shelter other than timber. Gooseberries have been profitable. Raspberries and strawberries have been grown with great success. I would recommend the use of valley lands for all small fruits. Strawberries will grow on any soil, when properly cultivated. Varieties recommended: Strawberries, Crescent and Charles Downing; blackberries, Snyder; raspberries, Gregg and McCormick. Strawberries should be grown in matted rows, raspberries and blackberries in stools. Of new varieties recently introduced, the Early Harvest blackberry is moderately productive,

but not of the best quality; of raspberries, the Shaffer Colossal is a very fine berry, and sustains its reputed character; of strawberries, the James Vick is very fine, and the Manchester good. The condition of all classes of small-fruit plantations on December 1st, 1884, was good. Quince trees succeed in this county, under good culture, when planted in rich soil made richer by well-rotted manure. Miscellaneous: There is a general confidence among the people of this county in fruit-growing, and farmers are planting largely for family purposes. There is an increasing disposition to adorn the home surroundings with shade and ornamental trees, flowering shrubs and plants. The condition of school-house yards is very bad. I do not know of a single house provided with shade trees.

## DAVIS COUNTY.—BY N. TRAFTON, MILFORD.

*(North half.)*

Fruits: All classes of orchard trees made a vigorous and healthy growth the past year. The crop in quantity, considering the nature of varieties, was of apples 33 per cent. of an average, peaches a failure, pears 50 per cent., plum and cherry full crop. The quality compared with preceding years was not quite so good of apples, an average of pears, inferior of plums, and good of cherries. The condition of trees on the 1st of December, 1884, was good of apples, peach, cherry, and plum, and of pears very good. Trees of all classes were generally healthy. Insects injurious to the trees were not prevalent; to the fruit, some varieties of the apple were almost destroyed by the codling moth. No means have been used to prevent their attacks but gathering the imperfect fruit which has fallen off the trees and giving it to hogs. The planting of orchard trees in the spring and autumn of 1884 was more extensive than usual of the apple, peach, pear, and plum; and the cherry in small quantities. Not over 10 per cent. of loss occurred, which resulted from the use of poor trees and neglect. Spring planting has given the greatest satisfaction. Of the Russian fruits, the old standard varieties of apples—Alexander and Duchess of Oldenburg—have been quite successful. The Kieffer and LeConte pear have been planted in this section, but not sufficiently long to determine their character. They have shown no disposition to blight. The older varieties of pears have not suffered from blight in this section. They are standard worked. The comparative results from apple orchards planted upon upland and bottom land, in 1884, have indicated no preference for either locality; but the evidence through a term of years is in favor of using the uplands, as producing the most profitable crops. The pursuit of orcharding has been a profitable investment with apple, peach, pear and cherry; the plum has been rather unprofitable. I would advise those having a suitable location to plant for family and extensively for commercial purposes. Vineyards: Upland locations with a south or southeastern exposure for an early product, and to extend the season a northern or northeastern exposure, have afforded the best results. The Concord, Delaware, Dracut Amber and Goethe are the most approved sorts, and should be planted in rows running north and south, 8 to 10 feet apart. Small fruits: Blackberries are a success, and quite profitable with the right kind of a location. Currants can be successfully raised, but are not profitable. Gooseberries seem to be at home in this locality. Raspberries are successfully grown. Some varieties of the strawberry are very prolific and profitable. A north or northwestern slope is the most successful location. The Kittatinny blackberry, Red Dutch currant, Houghton gooseberry, McCormick, Gregg and Doolittle raspberry, succeed the best. Condition of small-fruit plantations on December 1st, 1884: Blackberry, healthy and vigorous; gooseberry, raspberry and strawberry also in good condition. There are but few quince trees planted in this county, and they are not yet old enough to fruit. Garden vegetables—recommended list for extra-early crop: Peas, Tom Thumb, Landreth's Extra Early; beets, Early Turnip and Bassano; tomatoes, Acme; turnips, Early Flat Dutch and Purple Top. Miscellaneous: There is

a general confidence in fruit culture with the people of this county, and farmers are generally planting for family supply. There is an increasing disposition to plant shade and ornamental trees, and flowering shrubs and plants, to adorn the home surroundings. The district school-house yards are generally neglected.

(*South half.—By Wm. Cutler, Junction City.*)

Fruits: All classes of orchard trees made a vigorous and healthy growth the past year, except the cherry, which was moderate. The crop in quantity, considering the nature of varieties, was: Apples and cherries, 75 per cent.; peaches, failure; pear, full crop; plum, 50 per cent. of an average. The quality of apples, plums, and cherries, compared with preceding years, was good; of pears, better. The condition of all classes of trees on December 1st, 1884, was good, no disease having developed among any of them. Insects injurious to the tree have not been prevalent, only a few borers discovered. Their extermination was effected by the use of the knife and wire probe, and by the aid of the woodpeckers. Only the codling moth has injured the fruit. As a preventive, the dropping apples have been picked up, and the orchard pastured with hogs. The planting of orchard trees in the spring and autumn of 1884 was heavy of apples and pears, and moderate of peaches, plums, and cherries. Not over five per cent. of loss occurred. Spring-time is generally preferred for the planting of all sorts, though autumn is equally as good for apples. Of the recently-introduced varieties, the Kieffer and LeConte pear, Weaver and Baasett plum and Montmorency cherry were planted. Of the Russian fruits, many of the so-called Russian apples, and a very few apricots, have been planted, of which none have been successful. The Kieffer pear made a good growth as a standard, but poor as a dwarf—has not yet fruited. The LeConte pear, as a standard, is a very strong grower, but has not yet fruited. Neither has developed any tendency to blight. Blight has been very severe with most of the old standard varieties—the Duchesse de Angouleme and Howell, as dwarfs, Bartlett, Seckel, and Clapp's Favorite, as standards, having suffered the least injury. The results of upland and bottom-land apple orchards in 1884 favored in product the bottom locations; but through a term of years the upland has proven the most desirable. The pursuit of orcharding has been decidedly profitable of all classes excepting the peach, and I would advise the investment of capital and labor in this pursuit for family and commercial purposes. Small fruits: Blackberries have been profitable, and currants a success *this year*; gooseberries are productive, but find a poor market; raspberries have been profitable when well cared for; the strawberry frequently failed through drouth, and the late spring frosts. A rich land with a clay subsoil furnishes the best location. The Snyder blackberry, Gregg raspberry and Crescent strawberry have been the most profitable varieties, and should have the best of cultivation. Of the recently-introduced varieties, the Snyder blackberry has proven hardy, productive, but the poorest berry of all. The James Vick strawberry is very hardy, prolific, and a good berry. The condition of small-fruit plantations on December 1st, 1884, was quite satisfactory. The quince succeeds in this county. The blight is its only enemy. Garden vegetables—recommended list for extra-early crop: Beets, Egyptian Blood; radish, White Turnip; cabbage, Landreth's Extra Early. Second-early crop: Beets, Blood Turnip; cabbage, Early Winningstadt, and Fottler; peas, American Wonder. For a general crop: Beets, Long Blood Red; cabbage, Stone Mason and Flat Dutch; peas, Champion of England. Miscellaneous: There is a general confidence in fruit culture in this county, except among the careless and stockmen, and farmers are generally planting for a family supply. The home surroundings are generally adorned with shade trees, shrubs, and flowers. I do not know of a single effort being made outside of Junction City, to provide shade trees for the district school-house yards in this county.

## DICKINSON COUNTY.—By J. W. ROBSON, CHEEVER.

Fruits: All classes of orchard trees made a vigorous and healthy growth. The crop of 1884, in quantity, considering the nature of varieties, was: Apples, pears, and cherries, abundant; plums, medium; peaches, a failure. The quality compared with preceding years was, apples, pears, and cherries, superior. The condition of trees on December 1st, 1884, was sound. Insects injurious to trees were not prevalent; to the fruit, a few of the tree cricket, curculio and codling moth were discovered. The planting of orchard trees in 1884 was extensive of apples, light of peaches, pears, and plums, but large of cherries. The loss occurring of these plantings was from 30 to 40 per cent. Causes: First, damaged stock; second, attacks of the flat-headed borer; third, neglect; fourth, damage by rabbits and mice. Spring-time is considered preferable for the planting of fruit trees. Many of the so-called "Russian fruits" have been planted, but none have been a success. Blight has not troubled the pear trees in this county since the springs of 1877 and 1878. The product of apple orchards in 1884 was best on uplands. Orchardng has been a profitable investment, of all classes excepting the plum, and I would advise the investment of labor and capital in this pursuit for family and commercial purposes. Vineyards: Land sloping to the southeast is preferable for vineyards, which should be planted in the spring of the year and kept well cultivated throughout the season. The Concord, Catawba, Delaware and Salem are the most preferable varieties. Small fruits: Blackberries—Kittatinny and the Snyder did well last season. Currants have done well *this* year. The Houghton gooseberry has been a success. Raspberries and strawberries should be grown by every farmer and dweller in towns and villages. The proper location is any that is well sheltered, for the culture of small fruits. Kittatinny and Snyder blackberries, Red and White Dutch currants, Houghton Seedling gooseberry, and Miami, Doolittle and Turner raspberries are all desirable varieties. The condition of small-fruit plantations on December 1st, 1884, was good of all classes. The quince is successfully grown in some localities in this county. It receives no particular treatment, yet the bushes bore abundantly this season. Garden vegetables—recommended list for extra-early crop: Egyptian and Bassano beet, Valentine bean, Olive-shaped and Long Scarlet radish, Boston and Cabbage lettuce, American Wonder and McLean's Little Gem pea, Early Horn carrot, Early Ohio and Bonanza potato, Early Wakefield and Henderson's Early Summer cabbage, Early Minnesota and Crosby's Early sweet corn, Extra Early French and White Dutch cabbage, Hathaway's Excelsior and Canada Victor tomato. Second-early crop: Dwarf Golden Wax and Refugee bean, Henderson's Pineapple and Blood beet, Early Winningstadt and Fottler's cabbage, Long Scarlet Carrot, Egyptian and Stowell's Evergreen sweet corn, White Spine cucumber, Purple egg-plant, Hanson and Deacon lettuce, Danford's Wethersfield onion, Advance and Champion of England pea, Amber and Summer White radish, Early salsify, Boston Marrow, Little Gem and Hubbard squash, Acme and Trophy tomato, Purple Top Munich and White Egg turnip, White Star, Mammoth Pearl and Brownell's Best potato. Miscellaneous: There is a general confidence among our people in the planting of orchards, and farmers are generally planting for family supplies, but unfortunately they still persist in giving their orders to deceptive tree-peddlers. There is a general disposition to plant shade and ornamental trees, flowering shrubs and plants, to adorn the home surroundings, and the interest in this direction is gradually increasing. The district school-house yards in this county are bare, uninviting, and treeless, as ever.

## DONIPHAN COUNTY.—By S. HATCH, WATHENA.

Fruits: All classes of orchard trees made a vigorous and healthy growth in 1884. The crop in quantity, considering the nature of varieties, was: Apples 60 per cent. of an average; peaches, failure; pear, 50 per cent.; plum, 75 per cent.; and cherry a full



crop. In quality, compared with preceding years: Apples, inferior, owing to mildew; pear, an average; plum and cherry, good. The condition of all classes of trees on December 1st, 1884, was healthy. Insects injurious to trees were not more prevalent than usual; to the fruit, the codling moth on the apple and pear, and curculio on the plum and cherry, were prevalent. As a prevention against the attacks of the codling moth the trees were banded with paper, the bands examined weekly, and the worms killed. Hogs and sheep allowed to run in the orchard will keep this insect in check. The planting of orchard trees in the spring and autumn of 1884 was not extensive in any of the classes. Most of the planting is done in the spring, though fall planting is not objectionable. The Kieffer pear trees have been planted, and their growth is good, but they have not had sufficient test to determine their merits. The blight attacks all varieties of pears alike, excepting the White Doyenne, Buffum, and Duchesse de Angouleme. The results of orchards planted upon both uplands and bottom lands were about equal in 1884; many, however, prefer upland, as the trees are longer-lived and the fruit not so liable to be cut off by late spring frosts. The pursuit of orcharding has been a profitable investment in the growing of apples, pears and cherries, but of peaches and plums it has not. Vineyards: Locations having an open, elevated character, sloping to the southeast, south or southwest, are preferable. The Concord, Ives and Delaware are the most desirable varieties, and should be planted in rows from 8 to 10 feet apart, and given clean but shallow cultivation. Small fruits: Of blackberries, the Kittatinny was a failure, owing to attacks of rust upon the canes and leaves. Currants proved successful *this* year. Gooseberries mildewed badly. Raspberries and strawberries were successful and profitable. Raspberries and blackberries should have a northern exposure. Currants should have shade. Strawberries succeed in all locations, but are much earlier if grown upon southern exposures. The culture should be clean, shallow and level with all varieties of small fruits. The Snyder blackberry gives plenty of fruit every year, but is a small berry. The quality is good. The Souhegan raspberry is good, and very prolific; but has a tendency to ripen all at the same time, which is objectionable. Of small-fruit plantations, the Kittatinny blackberry was in good condition on the 1st of December, 1884; currants, gooseberry and raspberry, good to very good. Very few quince trees have been planted in this county; are a success in growth. Miscellaneous: There is general confidence in fruit culture in this county, and farmers are generally planting for family supply. The disposition to plant shade and ornamental trees, flowering plants and shrubs, to adorn the home surroundings, is general. There is a general feeling recognizing the importance of improving the school-house yards and providing them with shade trees.

ELLIS COUNTY.—BY MARTIN ALLEN, HAYS CITY.

Fruits: The growth of orchard trees was vigorous and healthy during the past year. The crop in quantity, considering the nature of varieties, was: Apples very fair, peaches light, pears a failure, plums good, and cherries very heavy. The quality of apples, peaches, and plums, compared with the yield of preceding years, was about an average, and that of cherries above an average. The condition of all classes of trees on December 1st, 1884, was excellent. Insects injurious to the trees were not prevalent. A few flat-headed borers made their appearance for the first time in 1883. The fruit of the apple and peach was occasionally injured by the native grasshopper, or the tree cricket. The planting of orchard trees in 1884 was lighter than in the previous years. Very little loss occurred during the season. Spring-time is generally considered the most preferable season for planting. Of the new varieties of fruits introduced, the Kieffer and Halloway pears, the Forest Golden and Shropshire Damson plums and Sappington cherry have been planted. Of the Russian fruits, there are some varieties of apples and apricots planted. Of the old varieties, the Red Astrachan has not yet bloomed, while

the *Duchess* of Oldenburg has proved itself the very worst to windfall. The Kieffer pear promises early fruitfulness. None of these have shown any tendency to blight. The pursuit of orcharding promises to become a profitable investment with apples, plums, and cherries. Of the other classes I am unable to speak. I would by all means advise the people of this county to plant fruit trees for family and commercial purposes. Vineyards: I would not hesitate to plant a grape-vine in any location. As to varieties, there has not been sufficient experience to designate. Plant in early spring, in ground deeply and thoroughly prepared; give them thorough cultivation, and work with some other crop between the rows. Small fruits: With this class there has been but little experience, but I think by means of irrigation they can be made to succeed. Garden vegetables—recommended list for extra-early crop: Scarlet Short-top radish, Winter onion, Early Ohio potato, Landreth's and other early sorts of peas, asparagus, and Linneus rhubarb. For a second-early crop: American Wonder pea and Beauty of Hebron potato. For a general crop, the list recommended for an earlier crop can be safely depended upon. Miscellaneous: To a certain extent there is confidence in fruit culture among the people of this county, and some farmers are planting for a family supply of fruit. The disposition to adorn the home surroundings with shade and ornamental trees, flowering shrubs, etc., is not general, but is increasing rapidly. Some of the district school houses in this county have plenty of shade trees, but not much progress has been made in this direction.

ELLSWORTH COUNTY.—By C. L. MYERS, ELLSWORTH.

(*West half.*)

Fruits: Orchard trees made a more vigorous and healthy growth the past year than for five years before. The crop in quantity, considering the nature of varieties, was good of all classes excepting the peach, and trees that were protected from the south wind did well. The quality of all classes of fruit, compared with preceding years, was larger and finer, except the cherry, which bore so full a crop that the fruit was small. The condition of all classes of trees on December 1st, 1884, was excellent. No disease developed among them, that I noticed. Of insects injurious to the tree none were prevalent, and few borers were found among the young apple trees and old peach trees. None were discovered injurious to the fruit, but the curculio in the peach and plum, and the codling moth in the apple. The planting of trees in 1884 was extensive of apples, but few of the other classes, excepting the cherry, which was heavy. Not to exceed 5 per cent. of loss occurred. Spring-time has been considered the most favorable season of the year to plant. Of the newly introduced varieties were planted the Kieffer and LeConte pear, the Montmorency and Olivet cherry. The Kieffer pear made a satisfactory growth, showing no disposition to blight. I cannot discover much difference between the upland and lowland apple orchards this season. In a term of years the bottom land is considered preferable. I would advise the investment of labor and capital in the pursuit for family and commercial purposes. Vineyards: Bottom lands located north of groves or bluffs afford the best location for vines. Thorough cultivation should be kept up the early part of the season, as one of the best preventives to the injury usually done by drouth. Small fruits: Of blackberries, the Snyder has done well. There was a full crop of currants the past season. The Houghton gooseberry succeeds, and raspberries and strawberries have done remarkably well on bottom land. Strawberry beds planted the past spring made a satisfactory growth. The condition of small-fruit plantations on December 1st, 1884, was good of all classes, excepting the strawberry, which was fair. Quince trees, planted upon bottom land, made a good growth. Miscellaneous: There is a general confidence in fruit culture among our people, and farmers are planting very generally for family supplies. There is a general disposition to adorn the home surroundings with shade and

ornamental trees. I know of but one school house which is provided with shade trees, and that is in the city of Ellsworth, and has a fine maple grove around it.

(East half.—By F. J. Swehla, Wilson.)

Fruits: All classes of fruit trees made a most vigorous and healthy growth, exceeding the last five years. A few of the apple trees bore fruit the past season; peaches, owing to a late frost, were light; pear trees are not old enough to fruit; cherries were a full crop, the trees being loaded. As compared with preceding years, the quality of apples, peaches, plums and cherries was good. The condition of the apple, pear and cherry trees on December 1st, 1884, was very good; peaches and plums fair. Of insects injurious to the tree, peach borers were prevalent; and were combatted with the use of knife and wire probe. There were none injurious to the fruit, except the curculio, and an unknown species, resembling a fly, which attacked the peach. The planting of orchard trees in 1884 was more extensive of the apple and cherry, than in preceding years; and the peach, pear and plum in very limited quantities. The loss did not exceed 5 per cent., and was caused only by accident or neglect. Spring-time is considered the most favorable season of the year to plant, the trees being dug in autumn and "*heeled in*" during the winter. Blight of the pear tree has been very light in this section. The result of upland and bottom-land apple orchards in 1884 has indicated a preference for upland. Most of all the apples that I have met with during 1884, and of which I sent samples to the State Fair at Topeka, were raised on upland. Their quality was very good; I would not want better, but more of them. Cherries have been a very profitable crop in this locality. I would advise the investment of labor and capital in the pursuit for family purposes. Small fruits: Rich, moist, sheltered bottom lands—such as we find this fruit growing in in their natural state—are to be preferred for their culture. The wild currant—native to this section—is worthy of attention. It is most sure to give good returns wherever planted. The condition of small-fruit plantations on December 1st, 1884, was good of blackberry, currant, and gooseberry; raspberry and strawberry, rather poor. The quince tree thrives in this section, but none have as yet fruited. Garden vegetables—recommended list for extra-early crop: Early Blood Red beet, Early Dwarf pea, Hollow Crown parsnip, succeed remarkably well. For a general crop: Hubbard squash and the Butman do well, and are worthy of cultivation. The common Delaware sweet potato and Irish potato will do well on new soil. The Egg-shaped turnip is the best we have tried. Miscellaneous: Confidence in fruit culture in this county, with the masses of its people, was dead and buried years ago, but this year it has been resurrected, and our farmers will begin to plant for family supplies of fruit. The disposition to plant shade and ornamental trees to adorn the home surroundings is being revived. About 50 per cent. of the householders are working in that line. The district school-house yards are generally neglected. Weeds and rubbish abound. I know of but one that has been furnished with a park, and that is in the city of Ellsworth and was planted in 1876.

GRAHAM COUNTY.—By ROBERT BOYS, WHITFIELD.

Fruits: All classes of orchard trees made a vigorous and healthy growth. None are old enough yet to fruit. The condition of all classes of trees on December 1st, 1884, was good. The best success has been obtained from spring-planting of trees in this section. Miscellaneous: There is not a general confidence among the people of this county in fruit culture as yet, but many think fruit will succeed when the county becomes more thickly settled, and more land is put under cultivation. Most of the settlers plant a few trees, and then let them take their chances. The school-house yards are sadly neglected, and in about the same condition as when the buffalo used to graze on them.

JACKSON COUNTY.—BY JACOB HIXON, HOLTON.

*(North half.)*

Fruits: All classes of orchard trees made a healthy and vigorous growth in 1884, and the crop in quantity, considering the nature of varieties, was good of apples, pears, and cherries, light of plums, and a failure of peaches. Compared with preceding years, the quality of apples, pears and cherries was good, plums poor. The condition of all classes of trees on December 1st, 1884, was satisfactory. Of diseases, the twig-blight developed in the apple and pear, and many peach trees died from the effects of the past winter. Insects injurious to the tree were not prevalent; to the fruit, the codling moth was very damaging. The planting of orchard trees in 1884 was medium in extent of all classes, and the losses occurring were about 20 per cent., resulting largely from careless planting. The Kieffer pear was planted two years ago. Fruit is medium in size, and from its appearance I hardly think it will prove profitable. It has shown no tendency to blight, but is a slow grower. Very little blight has ever appeared in this section upon any variety of pears. So far as I can learn, there is but very little difference in orchards, between upland and lowland locations, although upland is the most preferable with some planters. The pursuit of orcharding has been profitable of all classes, and people will be justified in investing their capital in growing such fruits for family and commercial purposes. Vineyards: A northwestern slope is preferable to any other for the vine. It should be planted in spring, in rows six feet apart each way, and cultivated so as to keep the ground loose and all weeds cleared out. The Concord, Delaware and Pocklington are the most desirable varieties. Small fruits: The blackberry has been successful, and I think there is no doubt of its being made profitable. Currants can be raised, if properly cultivated. Gooseberries, raspberries and strawberries are completely successful when planted in sandy loam that is somewhat moist. The Crescent, Monarch of the West, Captain Jack and Manchester strawberries are recommended varieties. The Snyder blackberry does well, and does not kill by our winters. Fay's Prolific currant has been planted, and made successful growth. Small-fruit plantations of all classes were in good condition on December 1st, 1884. The quince tree has been tried here, but does not give the greatest satisfaction. Miscellaneous: There is a general confidence among our farmers in the pursuit of fruit growing, and many are planting for family purposes. Very few are adorning their homes with shade and ornamental trees, and flowering shrubs. The condition of our district school-house yards is very bad.

*(South half.—By J. W. Williams, Cope.)*

Fruits: All classes of trees made a very vigorous and healthy growth in 1884, excepting the cherry, which was ordinary. The crop in quantity, considering the nature of varieties, was: Of apples, 90 per cent. of an average; peaches, an entire failure; pears, a full crop; plums, 20 per cent., and cherries, 75 per cent. Compared with preceding years, the quality of many varieties of apples was inferior, others good; pears excellent, never better; plums inferior, and cherries very fine. The condition of trees on December 1st, 1884, was good of all classes. Of diseases, some apple orchards showed twig-blight, and some pear orchards were affected by blight. Very little attention has been paid to remedies for these diseases. Insects injurious to trees were prevalent. The means used for their extermination were a knife for the borer. The codling moth was the only species injurious to the fruit that gave us any trouble this year. The extent of planting in 1884 was light to fair only. The losses occurring did not exceed 25 per cent., and resulted generally from carelessness in handling. Spring-time is generally considered the most favorable for planting trees, and autumn for planting small fruits. The Kieffer and LeConte pears have been planted in this county. None are old enough to fruit. With me, these varieties have blighted. At least I planted a tree of each last spring; they started off nicely and grew for some time, when they began to show signs of blight.

Even the old standard varieties of pear are not subject to blight in this section. The results as to upland and bottom-land apple orchards, in 1884, do not present any material difference in these localities as to product, in either quantity or quality. The evidence of a term of years, however, would give the preference to uplands for orchard sites. The pursuit of fruit-growing has been profitable of all classes, and I would advise farmers to plant for family and commercial purposes. Vineyards: I would plant on a high and sloping location, presenting to the south or southeast. I have tried seven or eight different varieties; can see but little difference in regard to rot or productiveness. I prefer to plant in spring, and careful planting in ground that has been well prepared and deeply stirred. Vines should be thoroughly cultivated each year, and carefully pruned in winter or early spring, and given a light summer pruning. The Pocklington promises to be a good acquisition to our list, though probably not sufficiently tested yet to be recommended. Small fruits: All classes are equally successful, and no class of fruit which I grow pays me better than the strawberry. The highland is the most suitable for the blackberry and the raspberry; in fact, all kinds of small fruits do well upon highlands. They should have good culture to insure success. Of the *new* varieties, the Manchester strawberry is promising. The plant, however, does not seem to be vigorous. Big Bob produces a very fine berry. The condition of small-fruit plantations on December 1st, 1884, was good to very good of all classes. Miscellaneous: There is a general confidence among our people in fruit culture, and the farmers generally are planting for family purposes. Very few are disposed to ornament their home surroundings with shade and ornamental trees, flowering shrubs, and plants. As to district school-house yards, I have traveled over very nearly all parts of this county, and find a general neglect. I know of none nicely adorned with shade trees and shrubbery.

JEFFERSON COUNTY.—BY JOSHUA WHEELER, NORTONVILLE.

(*North portion.*)

Fruits: All classes of orchard trees made a vigorous and healthy growth in 1884. The crop in quantity, considering the nature of varieties, was fair of apples, plums, and cherries, and an average of pears; peaches were a failure. Compared with preceding years, the quality of apples was not so good, but that of all other classes was equal. The condition of all classes of trees on December 1st, 1884, was good. The only disease developed was the blight in the apple and pear trees. Insects injurious to the fruit were prevalent. The planting of orchard trees in 1884 was extensive of apple and peach, but light of other classes. The season was very favorable, and but very few trees failed. Spring-time is generally preferred for the planting of fruit trees. Of new varieties of fruit, the Waterloo and Palmerston peach, and the Kieffer pear were planted. None of the latter have as yet fruited, nor do they show any disposition to blight. Of the old standard sorts, the Bartlett, Flemish Beauty, Beurre de Anjou and Seckel, as standards, are least liable to this disease. The results of upland and bottom-land apple orchards in 1884 do not show any material difference in quantity or quality of the product. But for a term of years the upland locations are the most profitable. The pursuit of orcharding has been profitable in some locations—near the bluffs of the Missouri river—and I would advise investments in this pursuit for family and general purposes. Vineyards: The Concord, Delaware, Martha, Brighton and Champion are the most successful varieties, and should be planted in the spring of the year. Small fruits: All classes can be profitably grown, except the gooseberry. The blackberry, raspberry, strawberry and currant should have a northern exposure and protection from south winds. They should be so planted as to afford easy opportunity for culture with horsepower. The Snyder blackberry has been grown successfully in this county. James Vick strawberry and the Old Ironclad are quite promising new varieties. The condi-

tion of small-fruit plantations on December 1st, 1884, was good of all classes. Garden vegetables—recommended list for extra-early crop: Peas, American Wonder, McLean's Little Gem; radishes, Red Turnip; beans, Early Valentine; spinach; potatoes, Ward's No. 1, Chicago Market; beets, Bassano; corn, Early Minnesota. Second-early crop: Peas, Champion of England; beans, Marrowfat; onions, Red Wethersfield. For a general crop: Peas, American Wonder, Champion of England; beans, Giant Wax; onions, Red Wethersfield; potatoes, Chicago Market, Mammoth Pearl, Early Ohio; corn, Mammoth Sugar. Miscellaneous: There is a general confidence among our people in fruit culture in this county, and farmers are generally planting for family use. There is an increasing disposition to ornament the home surroundings with shade and ornamental trees, flowering shrubs, and plants. Some few district school-house yards are provided with shade trees.

(*Central portion.—By Edwin Snyder, Oskaloosa.*)

Fruits: All classes of orchard trees made a vigorous and healthy growth in 1884. The crop of fruit in quantity, considering the nature of varieties, was fair of apples, pears, and plums, good of cherries, and a failure of peaches. The quality, compared with preceding years, was, apples poor, and of all other classes good. All classes of trees were in good condition on December 1st, 1884. Of insects injurious to trees, the apple-tree borer is always present, and is combatted with a knife and wire probe. There are none present injurious to the fruit. The planting of orchard trees during 1884 was about an average in extent of other years, and the loss occurring was very light. Spring-time is generally considered the most desirable period for the planting of trees. But very little if any difference was discovered in 1884 as between the product of apple orchards on upland or lowland; but as a general rule the upland orchards are the most profitable. The growing of apples, pears, and cherries has been profitable, the results with other classes is yet in doubt. I would emphatically encourage the planting of fruit for family and commercial purposes. Small fruits: All classes can be successfully grown, and are profitable for family use. The condition of all classes of small-fruit plantations on December 1st, 1884, was good. Miscellaneous: There is a general confidence in fruit culture among our people, and farmers generally are planting for family uses, and their homes are being surrounded with shade and ornamental trees, flowering shrubs and plants. The district school-house yards are generally in fair condition. About 10 per cent. have shade trees planted around them.

(*South portion.—By H. R. Roberts, Perry.*)

Fruits: All classes of orchard trees made a vigorous and healthy growth in 1884. The crop in quantity, considering the nature of varieties, was: Of apples, about 85 per cent.; peaches, a failure; pears and plums, 50 per cent.; and cherries, a full crop. The quality of all classes was not quite so good as in preceding years. The condition of trees on December 1st, 1884, was good of all classes. Of diseases, only the twig-blight in the apple was developed. Insects injurious to the tree were not prevalent. The codling moth and tree cricket did some damage to the fruit. The planting of apple trees in 1884 was extensive; of peaches, an average of other years; and of other classes, light. Trees that were in good condition, and properly set and cared for, were a success. Spring is generally considered the most favorable time for the planting of trees. The Kieffer and LeConte pear were introduced to this section this season, but I can give no conclusion as to their value. The results of upland and bottom-land apple orchards in 1884, indicate no preference as to locality. I think, as a rule, the upland has a little preference, as regards early and late spring frosts only. The pursuit of apple orcharding has been profitable; I know of no branch of farming which pays so well. Peach, pear, and plum, I think, are better adapted to the southern districts of this State. The Early Richmond cherry does finely in this section, but the trees are too expensive to be

planted extensively. Vineyards: A deep, rich, moist loam, well surface-drained, inclined to the north and northwest, with a midland altitude, is the most preferable location for the vine. The Concord, Ives and Dracut Amber are the most profitable sorts to grow; should be thoroughly and well cultivated during the forepart of the season. Small fruits: The blackberry I consider the queen of this class of fruits, and no family that owns five acres of land should be without it. As a market berry it is the best of all classes. The strawberry is good, but it requires more skill and careful culture. Gooseberries and raspberries do fairly well wherever cultivated. I do not think there is so much difference in the location selected for small-fruit culture, as there is in good, thorough cultivation of the ground in which they are planted. The condition of small-fruit plantations on December 1st, 1884, was good of all classes. The quince tree is succeeding in this county, and fruiting moderately well. Miscellaneous: There is a general confidence among the people of this county in fruit culture, but while some are enthusiastic, others express doubt of the future. Farmers are generally planting for family purposes. Among the better classes there is a disposition to adorn the home surroundings with shade and ornamental trees, flowering shrubs, and plants. A few of the district school-house yards are provided with shade trees, while others are as barren as the arid fields.

JEWELL COUNTY.—By E. T. BYRAM, JEWELL.

Fruits: All classes of orchard trees made a vigorous and healthy growth in 1884. The crop in quantity, considering the nature of varieties, was of apples an average, peach, pear and plum light, and cherries a full crop. Compared with preceding years, the quality of apples and pears was good, peaches better, plums very poor, and cherries very good. The condition of trees on December 1st, 1884, was fine of all classes. Insects injurious to trees were less numerous than in preceding years; to fruit, the codling moth and tree cricket were quite prevalent. The planting of orchard trees in 1884 was moderate of apple, peach, and pear; very light of plum, and quite extensive of cherry. As the season was highly favorable, there was very little loss. Spring-time is considered the most favorable period of the year for planting. Of newly-introduced varieties, Kieffer and LeConte pear trees have been planted, and they have shown no tendency to blight. The results of upland and lowland apple orchards in 1884 would indicate but a slight preference between such locations. Perhaps with equal care bottom land would be found most productive, but the general preference is for upland. The pursuit of orcharding has been profitable to a moderate extent with apple, and very profitable with cherry; the other classes are yet in doubt. Vineyards: I cannot see much difference in the result of varied localities. Of the varieties fairly tried, none seem to answer all purposes and locations as well as the Concord. The newer varieties have not been tested. I would plant in spring. Nothing more seems necessary than to plow the ground very deeply, leaving deep dead-furrows in which to set the rows. Close pruning is to be recommended. Also, enriching the ground with thoroughly-decayed manure, and giving the plants a thorough and frequent cultivation. Small fruits: Blackberries—nearly all varieties—have been a failure with me. Currants planted so as to be sheltered with grape-vines, and well cultivated; roots carefully protected, not only by mulching but by keeping them well covered with soil, have been successful. The Red Dutch adapts itself to this climate better than any other variety tried. Of the gooseberry, all varieties do well. The blackcap raspberries succeed; I have not yet found a red variety worth the trouble of setting out. With proper care, strawberries can be grown. The Crescent, Captain Jack, Monarch of the West, Wilson's Albany, and a few other varieties, have been tried, and succeeded. I have tried the Snyder blackberry, but am not satisfied with it as yet. The Shaffer's Colossal raspberry has not fruited yet, but the plants have made satisfactory growth. The condition of small-fruit plantations on December 1st, 1884, was

fair to very good of all classes. Miscellaneous: Farmers are generally very sanguine that most of the "tree-planters" are whistling to keep up courage. A great deal of fruit is being planted for family use, but little for commercial purposes. To a very gratifying extent, our people are adorning their homes by surrounding them with ornamental trees, flowering shrubs, and plants. Some of the school-house yards are being planted with shade trees, and the interest felt in this direction is annually increasing.

LEAVENWORTH COUNTY.—By E. J. HOLMAN, LEAVENWORTH.

Fruits: All classes of orchard trees made a healthy and vigorous growth in 1884. Considering the nature of varieties, the crop of the past season was, in quantity, of apples fair; pear, plum and cherry, medium to good, peach a failure. Compared with preceding years, the quality of apples and pears was not so good, but of plums and cherries it was an average. The condition of trees on December 1st, 1884, was very good of all classes, and no disease was discovered among any of them, except blight in the pear. Insects injurious to the fruit were prevalent. The means used to prevent their attacks and exterminate them were dusting and spraying with powder of pyrethrum and Paris green. The planting of orchard trees in 1884 was extensive of all varieties. Probably less than 10 per cent. of loss occurred. Spring-time is considered the best season of the year in which to plant. Of recently introduced varieties of apples were planted the Red Bietigheimer and Orange Pippin; of peaches, Waterloo, Gen. Palmerston, and Wheatland; of pears, Kieffer and LeConte; of plums, Emigrant; of cherries, Lueling. Of the Russian varieties of fruit, none of the apples excepting the old standard sorts were planted, and few of the apricots. In an experimental lot of several varieties of pear, tested on Mr. Kieffer's own ground near Leavenworth, the Kieffer alone is killed, body and branch, by the blight. I note its growth as generally vigorous, but it has not yet sufficiently fruited to enable me to form an opinion of its value. The LeConte trees are very thrifty, and I have not yet discovered any tendency to blight among them. Of the old varieties of pear, the Seckel, Beurre de Anjou, Howell, Beurre Clairgeau, Duchesse de Angouleme and Bartlett are least liable to blight. The result of apple orchards planted on upland and bottom land, in 1884, was about equal in the two localities. The product through a series of years prior to 1884 has been most valuable on the bottom lands. The pursuit of orcharding has been profitable of apple and pear only. I would advise the investment of labor and capital in the pursuit for family and commercial purposes. The main hindrances to success are the tenderness of the peach tree during our winters, and the liability of the plum tree to attacks of the black knot and its fruit to the depredations of the curculio. Our climate is too variable and severe for the cherry. Vineyards: The grape vine should be planted in rows at least eight to ten feet apart, and trained to a wire trellis six to ten feet high; it should be cultivated shallow, and summer and spring-pruned. The Concord, Martha, Early Victor, Worden, Goethe, Vergennes and Salem are the most valuable varieties. Small fruits: Of blackberries, the Snyder, Taylor and Early Harvest are the most promising. The older varieties are too subject to disease. Currants did well the *past* season, and will undoubtedly prove profitable to the careful culturist. Gooseberries are also promising, and did better than usual the past season. Raspberries and strawberries have been successful. Small fruits should be planted upon well-drained and moderately rich soil, on either high or low land. Of strawberries, the Crescent, Charles Downing, Sharpless, Capt. Jack and Miner's Great Prolific are the most valuable varieties. I would recommend growing them in matted bed, and giving them thorough cultivation during the first year, mulching with straw or prairie hay at the commencement of winter. Of the newly-introduced varieties of small fruits, the Early Harvest blackberry promises to be profitable for market, on account of the earliness of its ripening. The Snyder heads the list at present as a hardy



and productive variety. Fruit is medium, canes are vigorous and free from disease. Fay's Prolific currant is doing well, but is probably overrated as to the size of its berry. Lee's Prolific currant is a vigorous grower and a promising variety. Raspberry: The Hansel, a red variety, is hardy and healthy in plant, and produces a crop of medium-sized, good early fruit. Marlboro has a very strong plant; fruit large, and quality medium. Souhegan, a blackcap raspberry, is splendid, and the most profitable early variety we have. Shaffer's Colossal is a very vigorous grower, and produces the largest berry. It does not propagate readily and is a poor market sort, on account of the color of its berry (which is dark), and the fact that it is too tender for shipping. Strawberry: James Vick is promising for plantations where not allowed to mat too thickly; if grown thin the result will be satisfactory. Manchester is a failure, as the plants will not survive our season, dying out during the summer and fall. Big Bob is a *big fraud*; plants are not vigorous, fruit large but is coarse. Atlantic is a fine grower, but has not fruited. Old Ironclad has failed to sustain its reputed good qualities. Daniel Boone is a vigorous plant. Piper is a good grower, producing fairly of medium-sized fruit. The condition of small-fruit plantations on December 1st, 1884, was very good of all classes. The quince succeeds well in this county when planted on moist, sandy loam, well drained, and the trees are mulched. The land should be treated to a light top-dressing of salt. Garden vegetables—list of varieties preferred for an extra-early crop: Asparagus, Conover's Colossal; Cabbage lettuce; Landreth's Extra Early pea; Early Russian cucumber; Egyptian beet; White, or Silver-skinned onion; French Breakfast radish; Early Short-horn carrot; Red Speckled Valentine Bean; rhubarb; Early Ohio and Early Surprise potato; Early Jersey Wakefield cabbage; Henderson's Early Snowball cauliflower; Acme tomato; Adams's Extra Early corn; Summer Crookneck squash. Second-early crop: McLean's Little Gem pea; Crosby's Sugar corn; Early Rose potato; Paragon tomato; Henderson's Summer cabbage; Black Wax and Butter bean; Wethersfield Red onion; Red Turnip beet; Kohl Rabi; White Spine cucumber; White Turnip radish; Jenny Lind nutmeg melon; James Vick watermelon. For general crop: Champion of England pea; Long Purple egg-plant; Marblehead, or Stowell's Evergreen sugar corn; Cayenne pepper; Yellow Danvers onion; Short French pickling cucumber; Lima bean; Livingston's Perfection tomato; Flat Dutch cabbage; White Solid celery; Victor, Burbank, Mammoth Pearl, and Grange potato; Long Orange carrot; Hollow Crown parsnip; Hackensack nutmeg melon; Cuban Queen watermelon; Boston Marrow and Hubbard squash. Miscellaneous: There is a general confidence among our people in fruit culture, and farmers are generally planting for family supplies. They are also adorning their homes by setting about them shade and ornamental trees, flowering plants and shrubs. But very few district school-house yards have anything else than natural shade trees. Fortunately, the greater part of our school-house grounds in the eastern part of the county have been selected in natural groves of healthy, comfortable, inspiring trees. Where the supply is artificial, they are doing well.

#### LINCOLN COUNTY.—BY JACOB WIEDMAN, PLEASANT VALLEY.

Fruits: All classes of orchard trees made a healthy and vigorous growth in 1884. The crop in quantity, considering the nature of varieties, was very fine of apples; the quality was about an average of previous years—very good. Peaches were not very nice, because they were wormy. The condition of trees on December 1st, 1884, was good to very good of all classes. Of insects, none were prevalent, excepting those injurious to the fruit—represented by the curculio only. Planting of orchard trees in 1884 was very extensive of all classes, and the loss occurring did not exceed 5 per cent. Of the Russian apples, a few of the so-called varieties were planted, but I consider them a humbug. The Kieffer pear has been planted in this county, also the LeConte, and both are good

growers. No variety of pear trees planted in this county has as yet suffered from any disease. The results of apple orchards planted on upland and bottom land, in 1884, did not indicate any particular difference between the locations. The pursuit of orcharding has been a profitable investment in apple, plum, and cherry. The peach is not profitable, the crop being too often killed by the cold. Vineyards: I would recommend second-bottom land or upland, sloping to the east or southeast, as the best location. Vines should be planted early in spring, well cultivated in fore part of the first three years, and mulched during the latter part of each year. The Concord, Ives, Elvira, Catawba, Goethe, Missouri Reising, Champion, Neosho, Noah, Cynthia and Hermann are the most profitable varieties. Of the newer varieties, which have proven valuable acquisitions to our State list, are the Early Victor, Amber, Pocklington, White Ann Arbor, Antonette, (?) Faith, and Brighton. Small fruits: The Kittatinny, Lawton and Snyder blackberry are profitable. Currants do not succeed. The Houghton and Smith gooseberry, Doolittle, Hopkins, Shaffer's Colossal and Gregg raspberry, Wilson's Albany, Charles Downing, Capt. Jack and Miner's Great Prolific strawberry are profitable varieties. I would recommend that these be planted upon lowlands, where they will be most likely to succeed. Of the newer varieties of strawberries, the James Vick, Manchester and Piper are promising berries. The condition of small-fruit plantations on December 1st, 1884, was very good of all classes, excepting the currant. The quince is succeeding in this county, when planted in sheltered places, on rich land, and treated to a surface-dressing in the fall with salt. Miscellaneous: There is a greater confidence among our people in the pursuit of fruit-growing than ever before, and farmers are planting quite extensively trees and plants to supply their families with fruit. The home surroundings are being adorned with shade and ornamental trees, flowering shrubs, and plants, but there is not a district school-house yard in this county that has been planted to shade trees, to my knowledge.

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MARSHALL COUNTY.—BY JOHN MCKEE, MARYSVILLE.

Fruits: The growth of apple and cherry orchard trees was vigorous and healthy, of the other classes fair, in 1884. The quality of the product was better of apples than in preceding years, and equally good of cherries. The condition of fruit trees on December 1st, 1884, was good of the apple and cherry only. Insects injurious to the tree were represented only by the common tent caterpillar; of those injurious to the fruit, none were prevalent. The planting of orchard trees in 1884 was extensive, in the spring, and the losses incurred were very light. Spring-time is generally considered the most favorable period for the planting of trees. All varieties of pear trees growing in this county seem to be liable to the attacks of the blight. The results of apple orchards planted on upland and bottom land, in 1884, did not indicate any preference between the two localities, either as to quantity or quality of the product. The pursuit of apple orcharding has been a profitable investment in this county, and I would advise the investment of labor and capital in the pursuit for family and commercial purposes. Small fruits: All classes did well the past season. I would recommend for the culture of small fruits the use of a northern slope, and a continuous mulch. Miscellaneous: There is a general confidence among our people in fruit-culture, and farmers are generally planting to supply their families with fruits. Very few are disposed to adorn their home surroundings with shade and ornamental trees, shrubs, and plants. Very few of our district school-house yards are provided with shade trees.

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MITCHELL COUNTY.—BY E. A. TAYLOR, BELOIT.

Fruits: All classes of orchard trees made a vigorous and healthy growth the past season. The crop in quantity, considering the nature of varieties, was about 75 per

cent. of apples and pears, 10 per cent. of the peach, 25 per cent. of the plum, and a full average of other seasons. The quality, compared with other years, was good of all classes. The condition of trees on December 1st, 1884, was extraordinarily good of all classes, no disease having developed among them. Of insects injurious to the tree, none were prevalent, and the codling moth was the only one noticeably damaging the fruit. The planting of orchard trees in 1884 was extensive of the apple, plum and cherry only. No material loss occurred among them. Spring-time is considered the most preferable season of the year for the planting of fruit trees. It can be done quite successfully in autumn, provided the season is a wet one. Of the Russian varieties of fruit, the Red Astrachan, Duchess of Oldenberg, Tetofsky, and Walbridge apples, and some of the so-called Russian apricots, were planted. The apples are successful. The trees of the Kieffer and LeConte pears are good and vigorous growers, but neither has yet fruited. No indications of blight have appeared among them. The results as to bottom and upland orchards in 1884 showed no perceptible difference either in quantity or quality of the products. The pursuit of orcharding has been a profitable investment in all classes except the peach, and I would advise the investment of capital and labor in this direction for family and commercial purposes. Vineyards: I would not recommend for the culture of the vine any character of land that is not well drained. The Concord, Hartford, Ives, and Dracut Amber, when planted in spring—or autumn, if not too dry—in rows eight feet apart each way, and well cultivated, have been successful. Small fruits: The blackberry, gooseberry and strawberry have succeeded; the currant has failed; the raspberry succeeds when shaded. I would recommend the planting of small fruits in locations well protected from the winds, the intense heat of the afternoon sun, and on rich, well-drained land. The Snyder and Kittatinny blackberry, Smith's Improved, Downing and Houghton gooseberry, Gregg and Turner raspberry, Wilson's Albany and Crescent strawberry, are the most valuable varieties. All classes are benefited by mulching. Of blackberries, the Snyder is the most hardy and prolific, but poor in quality. Among new varieties of the strawberry, the Big Bob is a partial success, and Daniel Boone is promising. The condition of small-fruit plantations on December 1st, 1884, was good of all classes. The quince does not succeed in this county. Miscellaneous: Confidence in fruit culture among the people of this county is increasing, and farmers generally are planting to supply their families with fruit, and are adorning their home surroundings with shade and ornamental trees, flowering plants, and shrubs. About 10 per cent. of the district school-house yards in this county have been provided with shade trees, the others receiving no attention whatever.

NEMAHA COUNTY.—BY S. J. EDGERLY, SENECA.

Fruits: All classes of orchard trees made a healthy and vigorous growth in 1884. The quantity of the crop, considering the nature of varieties, was about equal to that of the previous year, excepting the peach and plum, which were light. The quality was equal to that of preceding years. The condition of trees on December 1st, 1884, was healthy of all classes. The planting of orchard trees in 1884 was quite extensive of all classes excepting the peach and plum, which were light. The loss occurring did not exceed 5 per cent. Spring-time is considered the most suitable season for planting. Of the Russian fruits, some of the varieties of crab apples were planted, and have made a good growth, but have not yet fruited. All varieties of pears grown in this county are subject to blight. The results between upland and bottom-land apple orchards in 1884 were favorable to uplands, both in quantity and quality of the product. The results of years prior also show the upland to be the most profitable and desirable. The pursuit of orcharding has been profitable in the growing of the apple and cherry only. I consider it advisable to invest in fruit-growing, both for family and commercial purposes.

Vineyards: Concord, Ives and Hartford Prolific, when planted in the spring of the year, in well-prepared upland having a northern slope, and given clean cultivation during the fore part of the season and mulching later, have generally proved successful. Small fruits: All classes have been successful; even currants can be successfully grown under favorable conditions. They should be grown upon well-drained upland. Of the newly-introduced varieties, the Snyder blackberry has been successful; the James Vick strawberry has hardly proven worthy of its reputation; Crescent, Capt. Jack, Sharpless and Wilson's Albany are stand-bys. The condition of small-fruit plantations on December 1st, 1884, was good of all classes. The quince does not succeed in this county. Miscellaneous: There is a general confidence in fruit culture among the people of this county, and farmers generally are planting fruit trees for family supplies. There is also a disposition to adorn the home surroundings with shade and ornamental trees, flowering shrubs, and plants. Very few of the school-house yards in this county have been provided with shade trees.

OSBORNE COUNTY.—By M. MOHLER, OSBORNE CITY.

Fruits: Orchard trees made a vigorous and healthy growth the past season. The crop in quantity, considering the nature of varieties, was fair to good of all classes. The quality, compared with preceding years, was rather better of all classes excepting the plum and cherry, which were only good. The condition of trees on December 1st, 1884, never was better of the apple, peach, and cherry, and good of the pear and plum. Insects injurious to the tree were not prevalent, and to the fruit no more so than usual. The planting of orchard trees in 1884 was quite extensive of the apple and cherry, but moderate of the other classes. The loss was very light, probably not to exceed 2 per cent. Spring-time is considered the most favorable period for the planting of trees. Of the Russian fruits, a few varieties of the apple were planted. The Kieffer pear trees planted two years ago made a slow growth. They show no disposition to blight. The LeConte is not known in this section. Blight has not as yet attacked any of the pear trees in this locality. The result as to upland and bottom-land apple orchards, in 1884, does not show any material difference as to localities. The pursuit of orcharding has not yet been a profitable investment, with any of the classes except the cherry, as the other trees are mostly too young to fruit. Yet I would advise our people to plant for family and commercial purposes. Vineyards: There is no material difference in the result in different localities. The Concord is the leading variety, and should be planted in spring-time and given a thorough cultivation through the season. Small fruits: The varieties of the blackberry heretofore tried have not been successful, but I think the Snyder will be, as it seems to be more hardy and a more vigorous grower than the Lawton or Kittatinny, which are the only varieties which have been tested here, and they are liable to be killed in winter. Currants do not succeed. All the common varieties of the gooseberry have been successfully grown. The native sorts of blackberry, which are found growing on the bluffs in this section, succeed when put under garden cultivation. Strawberries are not generally a success, but undoubtedly will be when properly treated. The Wilson's Albany only has so far been cultivated. The condition of small-fruit plantations on December 1st, 1884, was good of all except the blackberry and currant. Miscellaneous: There is a general confidence among our people in the success of the apple and cherry, and they are planting these classes generally and experimenting with some of the others. The disposition to plant shade and ornamental trees, flowering shrubs, and plants, to adorn home surroundings, is not general. However, as the country develops, our people will turn their attention to it. The condition of our school-house yards generally is very bad. After the homes the schools will be ornamented.

OTTAWA COUNTY.—By J. W. McLAREN, SUMMERVILLE.

*(North half.)*

Fruits: Orchard trees made a vigorous and healthy growth the past season. The crop in quantity, considering the nature of varieties, was full, of apple and cherry, light of peach, pear, and plum. The quality, compared with preceding years, was as good of the apple and cherry, but of the other classes not equal. The condition of trees on December 1st, 1884, was very healthy. Insects injurious to the tree were not prevalent, nor those injurious to the fruit numerous. The planting of orchard trees in 1884 was medium in extent of all except peach and plum, which was light. Spring-time is generally considered the most favorable season of the year for the planting of trees. Blight is not common among the pear trees in this county. The result between upland and bottom-land apple orchards in 1884 cannot be fully determined, but the nicest fruit was found upon our uplands. The pursuit of apple and peach orcharding has been profitable; of the other classes, it has not as yet. I would advise our people to plant the apple, pear and cherry for family and commercial purposes. Of plums, none but the wild varieties are productive. Peaches are not reliable. Vineyards: Of varieties, the Concord leads all others, and is profitable. They require mulching in this section to produce the best results. Small fruits: The Kittatiny blackberry has been profitable. The currant was not productive until 1884, when we had a good crop. The Houghton gooseberry has been profitable. Raspberries are doubtful. Strawberries have been successfully grown, and profitable. They should be planted in land sufficiently rolling to give them good water drainage and circulation of air. The condition of small-fruit plantations on December 1st, 1884, was healthy of all classes. The quince is not a success in this county. Miscellaneous: The confidence of our people in fruit growing has not been general until the success of the crop of 1884, which has strengthened their faith. Farmers are now inclined to plant sufficient trees to insure a family supply of fruit, and where circumstances will permit, they are planting shade and ornamental trees, flowering plants and shrubs to adorn the home surroundings. About ten per cent. of the school-house yards in this county are provided with shade trees.

*(South half.—By Van E. Butler, Delphos P. O.)*

Fruits: All classes of orchard trees made a vigorous and healthy growth the past season. The crop in quantity, considering the nature of varieties, was very large of all classes excepting the pear and plum, which were light. The quality, compared with preceding years, was better of all classes. The condition of trees on December 1st, 1884, was very fine of all classes excepting the peach, which was only fair. Insects injurious to the tree were prevalent. They were exterminated by the use of a knife and washes of various kinds. Those injurious to the fruit were in some orchards very numerous; in others very few. For their extermination many make no effort, while others harbor the bird and everything that will destroy the cocoon or insect. The planting of orchard trees in 1884 was extensive of all classes except the peach. The loss did not exceed 5 per cent., and was caused by borers on the one hand, and carelessness and ignorance on the other. Spring-time is generally considered the most favorable season of the year in which to plant. Of the recently-introduced varieties were planted some of the so-called Russian apples and the Kieffer and LeConte pears. These two latter varieties proved to be fair growers, but are not strongly recommended. They develop no indications of a tendency to blight, though having been planted for seven years. The results as to upland and bottom-land apple orchards in 1884 indicate a preference for second-bottom land, excepting that for the peach occasionally the highlands have proven the best. The pursuit of orcharding is now beginning to be profitable of all classes, and I would advise our people to plant for family and commercial purposes. Most of the failures in this pursuit have been caused by the work of insects and by ignorance. Vineyards: A

northern or western slope is generally considered the best location for a vineyard. The Concord, Dracut Amber and Martha have been the most successful varieties; should be planted in spring, in rows eight feet apart and four feet in the rows. Small fruits: All classes have been successful excepting the currant, which fails as a rule. They can be raised in the shade of a stone wall or board fence. Of strawberries, the Charles Downing, Crescent and Wilson's Albany have been the most valuable. The Snyder blackberry has given satisfaction. Of the new sorts, the Manchester strawberry has proven fairly successful. The condition of small-fruit plantations on December 1st, 1884, was good of all classes except the currant. Miscellaneous: There is a general confidence among our people in fruit culture, and farmers generally are planting for the supply of their families, and adorning the home surroundings with shade and ornamental trees. About ten per cent. of the school-house yards in this county are provided with shade trees.

PHILLIPS COUNTY.—By H. S. GRANGER, PHILLIPSBURG.

(*North half.*)

Fruits: All classes of orchard trees made a vigorous and healthy growth the past season. None are of sufficient age to fruit except the cherry, which produced a good crop both in quantity and quality the past season. The condition of trees on December 1st, 1884, was good of all classes. Insects injurious to trees appeared to some extent. The planting of orchard trees in 1884 was extensive of all classes except the pear. The loss occurring was heavy, probably about 50 per cent., occasioned by neglect. Autumn is considered the best season of the year to plant, provided the ground is moist. The pursuit of orcharding has been profitable of all classes excepting the pear, and I would advise the people of this county to plant for family and commercial purposes, if the same attention is given as to any other business, and one can wait for results. If not profitable in our county it is because of general neglect. Small fruits: The gooseberry and raspberry have been successful, where mulching has been used. The Snyder blackberry has done well in plant, but has not yet fruited. The condition of small-fruit plantations on December 1st, 1884, was good of the blackberry, gooseberry, and raspberry. Miscellaneous: There is a general confidence among our people in fruit culture, and farmers are generally planting for family supply of fruit, and adorning their home surroundings with shade and ornamental trees, flowering shrubs and plants. Very few of our school-house yards are provided with shade trees.

(*South half.—By John W. Knodle, Dickeyville.*)

Fruits: All kinds of trees mentioned have made a finer growth the past season than has ever before been observed in this county. Cherry trees bore an abundant crop; the other classes of trees are too young to yield a product. All classes of trees were, on December 1st, 1884, in a perfectly sound and healthy condition wherever well cultivated. For protection against rabbits I whitewash the bodies of my orchard trees. It saves them, and does no injury. Insects injurious to trees were not prevalent, although the borer in peach trees has been noticed. For their extermination, washes of whale-oil soap, ashes and soft soap, sulphur, and Paris green, are used. Insects injurious to the fruit have not been prevalent. All fruit observed has been found entirely exempt. The planting of orchard trees in 1884 was more extensive than usual of the apple, but light of the other classes. The loss incurred was not heavy—not to exceed 5 per cent., and was occasioned by late planting. I would plant all kinds in early spring, shrubs and small fruits in autumn. The growth of the Kieffer pear tree has been very healthy, and the LeConte does even better, I think, than the Kieffer. No tendency to blight has developed in either of these varieties. The results as to upland and bottom-land apple orchards in 1884 would give the preference to bottom lands as the most profitable

locations. I think the pursuit of orcharding would be very profitable under careful management, of all the fruits except pears, and I would advise our people to plant for family and commercial purposes. Vineyards: Bottom land is a preferable location. The Concord and Clinton have so far proved the most valuable varieties, and should be planted in early spring, in well-prepared ground which has been enriched. Small fruits: Hardy varieties of the blackberry I have no doubt will prove a success. Currants of all kinds will be successful, if the seasons continue as favorable as those of the past. The other classes of small fruits give evidence of being profitable. I would recommend for small fruits, bottom lands and level lands which are well sheltered. Clean and constant culture and mulching are essential to success. The Snyder blackberry does finely in this locality, when once established; have had no experience with any other variety. Lee's Prolific currant does finely, and appears to be perfectly at home in my ground. The McCormick, Turner and Canada raspberry do well. The condition of small-fruit plantations on December 1st, 1884, was good of all classes. The quince has made a very encouraging growth this season, and I believe it will finally succeed here. We have given it thorough cultivation and dressed the land with salt, and mulched to prevent the roots freezing in winter. It should have a rich garden soil. Miscellaneous: There is not as yet a general confidence in fruit culture, and farmers are shy about planting. Nor is there a disposition to plant shade and ornamental trees about the home, but I am succeeding in the nursery with many fine shrubs, and should the seasons continue as the last one I expect soon to have a magnificent display to gladden and cheer the heart. Not one district school-house in this county, that I am aware of, is provided with shade trees.

POTTAWATOMIE COUNTY.—BY JOSEPH LEACH, HAVENSVILLE.

(*North half.*)

Fruits: All classes of orchard trees made a healthy and vigorous growth the past season. The crop in quantity, considering the nature of varieties, was of apples an average of other years; plums fair, cherries large, pears light, and peaches a failure. The quality, compared with preceding years, was from fair to good of all classes. Insects injurious to tree and fruit have not put in an appearance. The planting of orchard trees in 1884 was extensive of apples only. The loss incurred among such stock as was shipped into this county was heavy, owing most largely to the condition of the trees when received. Spring-time is generally considered as the most favorable season of the year in which to plant. Of the Russian fruits, a few varieties of the apple were planted, and have made a good growth. The Kieffer pear has been planted very sparingly, as the people have been afraid of them, and I think it was just as well. The trees, so far, have escaped the effects of blight. The results as to upland and bottom-land apple orchards, in 1884, indicate no reasons for preference of locality, either for quantity or quality of product; but estimating the product for years prior to 1884, the uplands have been the most profitable. The pursuit of orcharding has been a profitable investment in all classes, and I would advise our people to plant for family and commercial purposes. Small fruits: Blackberries have not been a success for the last two years; currants, if a little shaded, do well; gooseberries produced a good crop; and the native wild raspberries did well—but few of the improved varieties are planted here; strawberries are successful. The condition of small-fruit plantations on December 1st, 1884, was good of all classes except the strawberry. The quince is not succeeding in this county, although treated the same as the apple tree, and planted upon upland soil. Miscellaneous: There is considerable confidence among the people in fruit culture in this county, and farmers are generally planting for family supplies. To some extent they are adorning their home surroundings with shade and ornamental trees, flowering plants and shrubs. None of our district school-house yards, that I am aware of, are provided with shade trees.

(*South half.—By John A. Beal, Louisville.*)

**Fruits:** All classes of orchard trees made a vigorous and healthy growth. The crop in quantity, considering the nature of varieties, was full, of apples and cherries only. The quality, compared with preceding years, was equal of pear and cherry, but less of apple. The condition of trees on December 1st, 1884, was good of all classes excepting the peach, which was fair. A few instances of twig-blight appeared among the apple. Insects injurious to fruit were prevalent, principally the codling moth. The planting of orchard trees in 1884 was extensive of the apple only. The loss incurred did not exceed eight per cent. Spring-time is generally considered the most favorable season of the year for planting. Of fifty pear trees, among which were a dozen of new varieties, only one was attacked with the blight, and that was a Buerre Superfin. The product of upland apple orchards, in 1884, was 40 per cent. greater than on bottom lands, with no difference in quality, excepting that the fruit of upland orchards ripens earlier. The pursuit of orcharding has been profitable, but its best days are about gone. I would advise our people to plant for family purposes, but not for commercial purposes, unless the locality is very favorably situated. **Small fruits:** All classes are profitable, excepting raspberries. The condition of small-fruit plantations on December 1st, 1884, was good of all classes. The quince is not generally a success in this county. **Miscellaneous:** The confidence of our people in fruit culture is general, and farmers are planting for family supplies. To some extent they are adorning their homes with shade and ornamental trees, flowering shrubs and plants. More than one-half of the school-house yards are provided with shade trees, which are in good condition.

REPUBLIC COUNTY.—BY O. O. A. GARDNER, HARBINE P. O., NEBRASKA.

**Fruits:** All classes of orchard trees made a vigorous and healthy growth the past season. The crop, considering the nature of varieties, was large of apple, full of pears, plums, and cherries, and very light—hardly any—of peaches. The quality, compared with preceding years, was better of apples, and equal in all other classes. The condition of trees on December 1st, 1884, was good of all classes. Insects injurious to tree or fruit were not prevalent in this county. The planting of orchard trees during the season of 1884 was extensive of all classes, and the loss was very light, scarcely exceeding two per cent. Spring and autumn planting are both practiced in this county, and each season has its advocates. Of the Russian fruits, the old varieties of apples—Alexander, Duchess of Oldenburg, and Tetofsky—have been planted, and the so-called Russian apricot has also been introduced into this county. These have been successful, excepting the apricot, which has not yet fruited. The Kieffer pear tree is a fine, vigorous grower, as also is the LeConte. Neither has yet fruited, nor has either developed any tendency to blight. The pursuit of orcharding has been profitable in all classes of fruit, and I would advise the investment of labor and capital in the pursuit for family and commercial purposes. **Vineyards:** There is no material difference observed in the results of planting in different locations. The Concord is preferred above all other varieties, and should be planted early in spring, given clean culture, short pruning, and careful attention. **Small fruits:** All classes have been successful. The Snyder blackberry has given entire satisfaction. The James Vick strawberry is too small, hence has not given satisfaction. Manchester is a fine fruit, and makes a very good plant. Piper is favorably considered, although it has been cultivated only one year. The condition of small-fruit plantations on December 1st, 1884, was good to very good of all classes. **Miscellaneous:** There is a general confidence among our people in fruit culture, but farmers are not generally planting extensively. I regret to say that there is not a general disposition to plant shade and ornamental trees, flowering plants and shrubs, to adorn the home surroundings.



We are trying to work up a taste for the ornamental. The present condition of our district school-house yards is bad; not over half-a-dozen have any trees planted on them.

RILEY COUNTY.—BY T. C. WELLS AND J. W. BLAIN, MANHATTAN.

**Fruits:** All classes of orchard trees made a vigorous and healthy growth the past season. The crop in quantity, considering the nature of varieties, was light of all classes excepting the cherry, which was large, and peaches, which were a failure. The quality, compared with preceding years, was about an average. The condition of trees on December 1st, 1884, was good of all classes excepting the pear, which had suffered from the blight, and some varieties of apples which were troubled with the twig-blight. A few cases of curled-leaf were discovered among the peaches. Insects injurious to the tree were very few, borers being occasionally found in the peach trees. Of those injurious to the fruit, the apple worm, or codling moth, and the curculio, appeared. Paper bandages have been used for the purpose of exterminating the codling moth, and a great many of that insect are destroyed by that means. The planting of orchard trees in 1884 was extensive of all classes. The loss did not exceed eight per cent., and resulted from careless planting and neglect. Spring-time is considered the most favorable season for planting. Of the Russian varieties of fruit, a few of the apples have been planted, and have not given entire satisfaction. The results as to upland and bottom-land apple orchards in 1884 showed but very little difference between the two locations. The pursuit of orcharding has been profitable with all classes of fruit excepting the pear, which is doubtful; and I would advise the investment of capital and labor in the pursuit for family and commercial purposes. **Vineyards:** I have not discovered any notable difference in the result between different locations. The Concord, Cottage, Delaware and Goethe have been the most valuable varieties, and should be planted in the spring, on land fairly subsoiled, and given good culture in the early part of the season. **Small fruits:** The blackberry is not successful every year, but is worthy of cultivation. Currant is about as profitable as the blackberry; the Red Dutch variety has been the most successful. Gooseberries are generally a success. Blackcap raspberries and strawberries have also been profitable. A partial shade afforded by a fence or trees is good for all of the above-named classes, unless we should except the strawberry. Of varieties, the Kittatinny blackberry, Doolittle, Gregg and McCormick raspberry, Large Red Dutch and White Grape currant, Charles Downing and Crescent strawberry, have been the most profitable. The Snyder seems hardy in this vicinity, more so than the Kittatinny, but not so good a berry in quality. The Shaffer's Colossal raspberry is a strong grower, berries very large, poor color, poor quality. The James Vick strawberry is a vigorous, hardy plant, berries firm, moderate size, and fair quality; has not proven satisfactorily productive. Big Bob is a good plant, but has not yet fruited. The condition of small-fruit plantations on December 1st, 1884, was good of all classes. The quince is succeeding moderately. The tree is inclined to blight to some extent; has been planted upon bottom land, mulched, and treated to an application of wood ashes and barnyard manure. **Miscellaneous:** There is a general confidence among our people in fruit culture, and a great many are planting apples, peaches and some grapes, but few are investing in small fruits. There is a general disposition to adorn the home surroundings with shade and ornamental trees, flowering plants, and shrubs. Our district school-house yards are badly neglected, with a very few exceptions; many are not even fenced.

RUSSELL COUNTY.—BY J. B. CORBETT, BUNKER HILL.

**Fruits:** All classes of orchard trees made a vigorous and healthy growth in 1884. The crop, in quantity, considering nature of varieties and age of trees, was good of apples, peaches, and cherries; pears and plums did not fruit. The quality, compared with pre-

ceding years, was superior of the classes above named. The condition on December 1st, 1884, of trees which had been properly cared for, was very good. Insects injurious to trees were not as prevalent as in former years. To exterminate the borers, we have washed the trees, early in June and July, with a strong solution of soap-suds and carbolic acid. The planting of orchard trees in 1884 was not extensive in this county. The loss did not exceed 20 per cent., and resulted from want of care in planting and after-culture. Spring-time is generally considered the most favorable season for planting. The result of upland and bottom-land apple orchards in 1884, shows no material difference as to growth of trees. The pursuit of orcharding has not been a profitable investment in this county, but can be made so in proper time. The cherry in some instances has yielded profitable returns, and I would advise the investment of capital and labor in the pursuit for family and commercial purposes. Small fruits; The blackberry and raspberry have been successful; currants, goosberries and strawberries have done quite well. The condition of small-fruit plantations on December 1st, 1884, was good of all classes. Miscellaneous: There is not a general confidence in fruit culture among our people, but there will be a great many orchards planted the coming spring. More farmers than heretofore, planted during the past season shade and ornamental trees to adorn the home surroundings. Our school-house yards are mostly destitute of trees and shrubs. I know of no school yard where tree-planting has been successful.

SALINE COUNTY.—BY J. A. BANKER, SALINE.

Fruits: The condition of all classes of fruit trees was vigorous and healthy during the past season. The crop in quantity, considering the nature of varieties, was good of apple, plum, and cherry, peaches light, pears fair. The quality, compared with preceding years, was not as good of any of the classes. The condition of trees on December 1st, 1884, was healthy and sound of all classes. Insects injurious to the fruit were the codling moth, in some localities quite numerous. The planting of orchard trees in 1884 was large of the apple, and an average of preceding years of the other classes. The losses incurred were very light, and were owing to the neglect of the planter. Spring-time is generally considered as the most favorable season to plant. Of the Russian fruits, the apricot was planted to some extent. The Kieffer pear was planted in small numbers, and is claimed to have fruited in this county. Pear trees in this section have not as yet been subject to the blight. The results as to upland and bottom-land apple orchards in 1884, give the preference to bottom locations. The pursuit of orcharding has been profitable with all classes, excepting the peach, which is uncertain. I would advise our people to plant for family and commercial purposes, of all classes. Small fruits: Blackberries do not yield a good crop; the red varieties of currants succeed where they are partially shaded; gooseberries, raspberries and strawberries yielded a profitable crop. The Snyder blackberry appears to be hardy. The Old Ironclad strawberry has been quite satisfactory. The condition of small-fruit plantations on December 1st, 1884, was good of all classes. The quince is a success, and bore a full crop the past season. Miscellaneous: There is a general confidence among our people in fruit culture, and farmers are generally planting for family supply, and to adorn their home surroundings with shade and ornamental trees, flowering shrubs and plants. Few of our district school-house yards are provided with shade trees.

SHAWNEE COUNTY.—BY H. W. LIPP, ROSSVILLE.

(North half.)

Fruits: All classes of orchard trees made a vigorous and healthy growth in 1884. The crop in quantity, considering the nature of varieties, was full, of apples, plums, and cherries; peaches failed, pears very light. The quality, compared with preceding years,

was very good of apples, plums, and cherries. The condition of trees on December 1st, 1884, was most excellent, excepting the pear, which had blighted to some extent. Insects injurious to tree or fruit were not prevalent. The planting of orchard trees in 1884 was very extensive of apples, light of all other classes. The loss occurring was very light. Spring-time is considered the most favorable season for planting. Of the Russian fruits, a very few of the apple were planted. Only a few of the Kieffer pear trees have been planted, none of which have yet fruited. These have shown no tendency to blight. The pursuit of orcharding has been a profitable investment in all classes excepting the peach and pear, and I would advise our people to plant for family and commercial purposes. Vineyards: Any location suitable for growing a crop of corn is well adapted to the growth of the grape-vine. Of varieties, the Concord, Ives and Goethe are the most valuable, and these should be planted in spring, in rows ten feet apart and six feet in the row; should be thoroughly cultivated and kept free from weeds. Small fruits: Blackberries have been successful; gooseberries, raspberries and strawberries have also been successfully grown, while currants have failed. The condition of small-fruit plantations on December 1st, 1884, was very good of all classes. The quince has not done very well, although it has been planted in rich, loamy soil, and given clean culture. Miscellaneous: There is a general confidence among our people in fruit culture, and farmers are generally planting for family supply. The disposition to adorn the home surroundings with shade and ornamental trees, flowering shrubs and plants, is quite general. Of the school-house yards in this township, two are seeded down to grass. One of these is provided with shade trees, which are in a healthy condition. One other will be planted to trees next spring.

(*South half.—By Thomas Buckman, Topeka.*)

Fruits: All classes of orchard trees made a vigorous and healthy growth in 1884, except the peach. The crop in quantity, considering the nature of varieties, was 60 per cent. of an average of apples, peaches a failure, 10 per cent. of pears, 20 per cent. of plums, and a poor crop of cherries. The quality, compared with preceding years, was of apples, inferior; other classes fair. The condition of trees on December 1st, 1884, was No. 1, with the exception of a light form of blight on some of the varieties of the apple. Insects injurious to the tree were not prevalent. Those observed were principally the handmaid moth. These were exterminated by removing the nest from the tree and destroying them. Insects injurious to the fruit were prevalent, principally the codling moth, which are on the increase. No other means to exterminate them have been introduced, except to make a hog range of the orchard grounds. The planting of orchard trees in 1884 was extensive of all classes excepting the pear. Spring is generally considered the most suitable season for planting. Kieffer pear trees have been planted in this locality. Their fruit is of doubtful quality; may be suitable for canning. The results of upland and bottom-land apple orchards in 1884 are about the same in each locality. The pursuit of orcharding has been profitable with the apple and cherry only. Small fruits: Blackberries and currants have not been profitable; the gooseberry has been a success; and the raspberry is still uncertain. The condition of small-fruit plantations on December 1st, 1884, was excellent of all classes except the blackberry and strawberry. The quince does not succeed in this county. Miscellaneous: There is a general confidence among our people in fruit culture, and farmers are planting for commercial purposes. There is a disposition among our people to adorn the home surroundings with shade and ornamental trees, flowering plants and shrubs, and the interest in this direction is increasing. The condition of our district school-house yards is unsatisfactory.

## TREGO COUNTY.—BY W. B. CRITCHFIELD, WAKENNY.

Fruits: All classes of orchard trees excepting the pear, made a good and vigorous growth in 1884. Apples produced their first crop this year, and considering the nature of varieties, it was full for young trees. The condition of trees on December 1st, 1884, was excellent of all classes except the plum, which was poor, and the cherry, which was only good. Insects injurious to the tree or fruit are not prevalent in this section. The planting of orchard trees in 1884 was not extensive; the per cent. of loss was very small—did not exceed 15 per cent. where any attention was given after planting. Spring-time is generally considered the most successful season in which to plant. From results so far, I would advise our people to plant for family purposes, but not for commercial at present. Small fruits: They have not been profitable so far, but evidence leads me to conclude that if proper attention were given they will be in the future. Currants, gooseberries and strawberries, I am satisfied can be raised to a limited extent, if they are shaded by some means during our hot, dry season, and given good culture and a liberal supply of manure in a well-decomposed state. Miscellaneous: There is a confidence among our people in fruit culture, but only a few have planted for family supply. There is not a general disposition to plant shade and ornamental trees to adorn the home surroundings. Our school-house yards are on the open prairie, with nothing to ornament their surroundings.

## WASHINGTON COUNTY.—BY DR. CHAS. WILLIAMSON, WASHINGTON.

(North half.)

All classes of orchard trees made a vigorous and healthy growth in 1884, excepting old peach trees. The condition on December 1st, 1884, was good of all classes except peach trees, which was only medium. The extent of all classes planted was greater than in previous years, except the peach, which was 50 per cent. less. Of the stock purchased of home nurseries, the loss was very light. Of Russian varieties of fruit, only the Duchess of Oldenburg and Tetofsky were used; these have done well. Of new varieties of pears, the Kieffer and LeConte were used; these show no tendency to blight, as yet—are young trees. Cannot discover any material difference in location as to upland and lowland, in the results of the product to indicate a preference. Apple and cherry orchards are profitable—other classes are not. I would advise planters to use all classes for family purposes, and for commercial those above named as profitable. Vineyards: Most any one will succeed with the grape, so easily is it grown. Would plant in autumn, in rows eight feet apart each way, and train to a trellis. The Concord and Martha are preferable varieties. Small fruits: Blackberries, winter-killed; currants, gooseberries, raspberries and strawberries bear heavily, and are profitable. I would recommend drained lowlands for all classes. Of the new varieties, the Snyder blackberry is fairly successful; Jas. Vick, Manchester and Indiana are promising; Big Bob, as big a fraud as its introducer. The condition of small-fruit plantations on December 1st, 1884, was good of all classes. The quince does not succeed in this locality. Miscellaneous: There is a general confidence in fruit culture among our people, which is strengthening each year, and farmers are planting for a family supply of fruits and adorning the home surroundings with shade and ornamental trees, and flowering shrubs. Our school-house yards are largely neglected and bare of shade trees.

(South half.—By Alex. Spiers, Linn.)

Fruits: Apple, peach and cherry trees made a good growth, pear and plum fair, the past year. The crop of apples and cherries was large, and of better quality than that of the preceding five years; pears and plums bore lightly; peaches failed. The condition

of all classes was good on December 1st, 1884. Insects have done but little injury to trees in this section. A few borers have been noticed, and the only means used for their extermination is cutting them out of trees infested. All classes of fruit trees are being extensively planted. More interest is being given to the culture of pears, and most of the newly-planted orchards include some plum trees. The losses reported are very light for the past two years—probably not more than two per cent. Most of the planting has been done in spring, which is considered a preferable season. Of the Russian fruits, varieties of apple and apricot have been planted. The trees have done well, but suspicion exists among planters that in the fruit they will be disappointed. The Kieffer and LeConte pear trees are reported as doing well in some localities, in others a failure. Neither of these have fruited, or shown any disposition to blight; in fact, I have not seen a case of pear-blight on my grounds. Bottom-land apple orchards yield the heaviest crops. Most of the oldest orchards, being on such lands, are the most profitable. Uplands produce the finest-appearing fruit, and the finest quality. The pursuit has been a profitable investment with the apple, peach and cherry only; and I would recommend investments in the pursuit for family and commercial purposes. Vineyards: Any location prepared by deep tillage is successful. Set plants in rows eight feet apart, and six feet in rows. Keep spaces between well cultivated. Varieties preferred, Concord, Delaware, Lady, and Martha. There are many other varieties, but none better than the Concord for all purposes. Small fruits: All classes succeed when properly cared for, excepting currants, which are hardly a success. I prefer upland for small fruits as well as for all other classes—surrounded with groves of trees. It may not give as large fruit, but a finer and richer quality in the product. Small-fruit plantations of all classes were good on December 1st, 1884, excepting currant and strawberry, which were only fair. Quince trees, planted on black, sandy loam, and treated the same as an apple tree, make a fine growth. I do not know of any that have fruited. Garden vegetables—for an extra-early crop: Beans, Early Six-Weeks, Black Wax; beets, Early, Blood Turnip; cabbages, Early York, Early Wakefield; radishes, Early Long Scarlet; peas, Early Kent; lettuce, Hubbard, Market; potatoes, Early Ohio and Beauty of Hebron. Second-early crop: Beans, White Kidney and Navy; beets, Long Blood Red; cabbage, Savoy; lettuce, Black-seeded, Simpson, Tennis Ball; peas, Tom Thumb, White Marrowfat; Radishes, Scarlet Turnip. General crop: Cabbage, Large Late Drumhead and Premium Flat Dutch; parsnip, Hollow Crown; potatoes, Peachblow, Buckeye; tomato, Gem, Gen. Grant, Acme; squash, Hubbard, Boston Marrow; Turnip, Purple-top Strap-leaf. Miscellaneous: The confidence of our people in fruit culture is strengthening, and farmers are generally planting for family and market purposes. They are planting more or less each year of shade and ornamental trees and flowering shrubs, to adorn the home surroundings, and beautify the country. I know of no school-house yards which are supplied with shade trees in a healthy condition; as a rule, very few are supplied at all.

WYANDOTTE COUNTY.—BY FRANK HOLSINGER, ROSEDALE.

Fruits: Tree growth in 1884, apple very unsatisfactory, peach and plum good, cherry splendid, pear badly blighted. The crop of fruit was light; apple 20 per cent., pear 30 per cent., plum 10 per cent., cherry 20 per cent., of a full crop; peaches a total failure. In quality it was not equal to preceding years. The condition of trees on December 1st 1884, was very good. Insects: The round-headed apple-tree borer was unusually active, and to facilitate the efforts for their destruction would advise mounding of the earth against the tree, which will compel the parent to deposit her eggs well up, and where the presence of the worm can be easily detected and cut out. Apples were infested with the curculio, and the codling moth developed later in the season. The former can be cap-

tured and destroyed by jarring the tree, which causes them to drop to the ground or on a sheet placed under the tree to catch them. The planting of apple trees was not as extensive as in preceding years; a great many peach, cherry, and plum, and very few pear trees were planted. The season being very favorable, losses seldom occurred. I prefer spring-time for such purposes, though planting may be done in autumn frequently, to save time. Of the recently-introduced varieties, the following were planted: Peach, Wilkins's Chief, Mrs. Brett, Gen. Lee, and Bonanza; pear, Birkett, LeConte, and Kieffer; cherry, Esail Krich. Of the Russian fruits, Tetofsky apple. The Kieffer and LeConte are by no means *blight-proof*; have but little faith in the success of the former variety. The LeConte is preferable. Some of the Kieffer trees were killed outright by blight, while the LeConte suffered only from twig-blight. Orchards on bottom lands produced the best crops in 1884. The quality was variable. In some orchards it was fair, while on adjoining plantations the product was very inferior in every feature. Heretofore, upland orchards have produced the best fruit, and bottom lands have been considered objectionable. The past year is an exception. The pursuit of orcharding has been profitable during the past ten years—1884 excepted—with all classes excepting pear and peach, and I would recommend investments in the pursuit, wherever opportunity offers, for family and commercial purposes. Vineyards: Location, any hillside where the soil is well prepared, will answer for the grape-vine. Plant in spring-time, in rows eight feet apart each way; cut the tops back to only one or two buds, and put down a stake to mark the row, and allow only the canes to form the first year. Small fruits: Rust has destroyed all old plantations of blackberry; currant yielded a good crop in 1884, and gives encouragement to planters of success in the future; gooseberry has not given entire satisfaction. The Smith's Improved I consider a valuable acquisition. Raspberry is easily produced, and very profitable. Strawberry has been unsatisfactory in results; few varieties have escaped "rust," and fruit has been inferior. Recommendations: Land for raspberries should be rich, and well drained; for strawberries, subsoiled. Varieties most successful are, of the blackcaps, Hopkins and Gregg; red varieties, Thwack. Cultivation should be thoroughly done, with any suitable implement. New varieties, of blackberries, Early Harvest is promising; plant perfectly hardy; passed through the winter of 1883 and 1884 without the slightest injury. Berry small, but early ripening. Snyder, valuable; plant very hardy and productive. Has not been attacked with rust yet. Raspberry—Hansell is worthy of cultivation; they possibly may ripen too irregularly to be valuable for market. Strawberry—James Vick, a vigorous plant; not valuable. Manchester plants rust badly. The condition of small-fruit plantations on December 1st, 1884, was good of all classes, with the exception of blackberries, where the Kittatinny and other old varieties were used. Quinces do moderately well; some good fruit is produced. Miscellaneous: The production of fruit in successful quantities is not doubted by our people. The only question now affecting the profits is a good market. Quite an interest is being shown in the ornamentation of the home surroundings with shade trees and flowering shrubs. Our school-house sites are generally selected in groves of natural forests, and the trees are permitted to remain for shade. In other locations, trees are sometimes planted.

## CENTRAL FRUIT DISTRICT.

## ANDERSON COUNTY.—BY J. S. MCCARTNEY, GARNETT.

Fruits: All classes of orchard trees made a vigorous and healthy growth the past season. The crop in quantity, considering the nature of varieties, was: Apples, fifty per cent.; peaches, a failure; pears, twenty-five per cent.; plums, ten per cent.; cherries, fifty per cent. The quality, compared with preceding years: Apples, equal; pears, good; plums and cherries, fair. The condition of trees on December 1st, 1884, of all classes, was good. No diseases developed among any of them excepting the pear, in which blight occurred. Of insects, the canker worm and species of borers were prevalent. The means used for their extermination: For the canker worm, spraying the trees with a solution of London purple, at the rate of one pound to fifty gallons of water; the knife and probe vigorously applied to the borers were the best remedies. Insects injurious to fruit have been confined to the codling moth ("apple worm"). The planting of apple, peach, and cherry trees, the last spring and autumn, was extensive; pears and plums, none. Of these plantings, thirty-three per cent. of loss occurred, caused by purchasing the trees of Eastern agents, and carelessness in planting and after-treatment. In this county, spring planting has been found preferable. None of the Russian varieties of fruits have as yet been planted in this county; neither has the Kieffer nor LeConte pear. Pear blight: No perceptible difference has been discovered in either class of dwarf or standard pear trees, of any varieties, as being less liable to the attacks of this disease. The product in quantity and quality, of orchard trees planted upon upland, would indicate such localities as preferable. Of all classes of orchard trees, the apple and cherry alone were profitable. Vineyards: Well-drained upland, having a southern slope, is the most preferable location for vines, and they should be planted in the spring of the year. The only variety succeeding here is the Concord, which were trained upon trellis, in rows six feet apart and eight feet in the row. Small fruits: All classes are profitable, except the currant. A sheltered, well-drained location, having a deep, rich soil, is the most desirable. Of strawberries, the Wilson's Albany and Charles Downing, grown in matted rows three feet apart, and mulched, have generally succeeded. The Snyder blackberry has not proven more desirable than the Kittatinny. The condition of small-fruit plantations on December 1st, 1884, was good of all classes. Quinces are not a success in this county. Garden vegetables: List of varieties recommended for extra-early crop: Little Gem pea, French Breakfast radish, Green Cos lettuce, Jersey Wakefield cabbage, Acme tomato, Early Turnip beet. Second-early crop: Henderson's Early beet, Long Scarlet radish, Hanson lettuce, Jersey Wakefield cabbage, Trophy tomato. For a general crop: Champion of England pea, Long Scarlet radish, Late Drumhead lettuce, Flat Dutch cabbage, Trophy tomato, Wethersfield onion, Blood Turnip beet. Miscellaneous: There is a general confidence in fruit culture in this county, and farmers are generally planting for family purposes, and are disposed to plant shade and ornamental trees and flowering shrubs to adorn their home surroundings. The school-house yards are in very poor condition, few being found which are properly cared for.

## BARTON COUNTY.—BY JOSEPH GAULT, GREAT BEND.

(East half.)

Fruits: All classes of orchard trees made a vigorous and healthy growth the past season. The crop of apples was large; of peaches moderate in some localities, and none in others; pears and cherries fair, but few trees old enough to bear; plums rather small,

which suffered from the work of the curculio. In quality, compared with preceding years, apples, pears, and plums were better, while peaches and cherries were about equal. The condition of fruit trees, on December 1st, 1884, was good of all classes. No new disease developed among them. Insects injurious to trees were not prevalent, excepting borers in peach trees. The means used for their extermination have been cutting them out with a knife. Of those injurious to fruit, none appeared excepting the curculio in the plum and the peach. No effective means have been used to exterminate these. The planting of orchard trees in the season of 1884 was not extensive. The season being favorable, the loss of the planting was very small. Spring-time is generally considered as the best for the planting of fruit trees. Pear blight has not made its appearance in this section. The results as to apple orchards on bottom land and upland, so far as observed, favor bottom lands. While such localities do not yield as heavily as others, the quality is much better. The profitableness of orcharding in this section cannot as yet be fully determined, as but few orchards have arrived at a bearing age, and the product has not been in excess of needs for family purposes. I would, however, most assuredly advise the investment of capital in such a pursuit. Orcharding will be profitable to the careful manager, but many fail from want of care in planting and cultivation to get their trees fairly started. Small fruits: Blackberries can be grown, but I am not so sure about their success in fruiting; were a fair crop the past season. Currants yielded similarly to blackberries. Gooseberries were a most abundant crop. Raspberries a failure. Strawberries in some localities yielded a fair crop. The condition of small-fruit plantations on December 1st, 1884, seemed to be good of blackberry, currant and gooseberry only. Miscellaneous: Since some of our orchards have begun to bear, the fruit seen on the trees, trees growing smooth and healthy, strengthens confidence in fruit culture and is becoming more general. I think the majority of farmers are planting more extensively than ever before. I cannot say that the disposition to plant shade and ornamental trees, and flowering plants and shrubs to adorn the home surroundings is general, but it is practiced to some extent. With some few exceptions, the school-house yards in this county are still in a state of nature.

(*West half.—By F. W. Bester, Pawnee Rock.*)

Quite a crop of apples, peaches and cherries were grown in the eastern part of this county during the year 1884. In this, the western half, only a very few apple trees have reached a bearing age, and the crop was light. Some few seedling peaches were also grown. Some young cherry trees bore a full crop, considering their size and age. Of small fruits, a few raspberries (blackcap varieties) bore nice fruit as a first crop; blackberries and gooseberries were a full crop—berries of nice quality. The prospect for another year is promising. All classes of trees went into winter quarters in good condition, and such as have reached bearing age are full of well-developed fruit buds. I find peach buds on orchards planted on bottom lands all killed; also on the highlands where the trees had made a strong summer's growth, and which had not been "pinched back" during their growth. On those which had been treated to the summer "shortening-in" system, only about one-half the fruit buds are killed; hence the advantage of this treatment. I find fruit buds on apple, pear, plum and cherry trees in good condition. Blackberry and raspberry canes which were left to nature's care are all dead, while those "shortened in" are all right. Grape vines look promising for next year. Of my own planting last spring I find the following results: The blackberry plants made an unsatisfactory growth; Wilson's Albany and Jas. Vick strawberries made poor growth and but few new plants. Grapes: The Bacchus, a seedling of the Clinton, made the best growth, and next in order as named: Pocklington, Duchesse, Lady Washington, Elvira, Brighton, Catawba, Diana, Champion, Ives, Salem, Martha, and Concord. Plants of the last variety did not do well, as they were received late in the spring and were in a bad



condition. Gooseberry plants made a good growth. Raspberries: Of the blackcaps the Gregg made the best growth, and next in order named, Tyler, McCormick and Souhegan; of the red sorts, Cuthbert and Turner were quite successful. Strawberries: The Charles Downing made the best growth; Sharpless and Capt. Jack succeeded when set out. Apple roots grafted last winter made from two to four feet; peaches from seed heavy; and Russian mulberry from seed two to five feet growth. I am satisfied that with proper attention, fruits of all description, hardy in Illinois, can be produced in this county.

CHASE COUNTY.—By J. W. BYRAM, CEDAR POINT.

Fruits: All classes of orchard trees made a healthy and vigorous growth the past season, and produced about thirty-three per cent. of a crop of apples, none of peaches, fifty per cent. of pears and plums, and a full crop of cherries. The quality of all classes of fruit was about the same as that of the preceding year. The condition of trees on December 1st, 1884, was sound, and wood well ripened, of all classes. Insects injurious to trees were not prevalent, the crown borer being the only one discovered. Its attacks were not damaging. These were exterminated by the use of the knife and wire probe. Of insects injurious to fruit, the codling moth was the only species discovered, and that in small numbers. The planting of apple trees in the season of 1884 was more extensive than in any of the previous years. But few peaches, pears and plums were planted, while the cherry was planted very extensively. The loss in these plantings did not exceed five per cent., and that was largely due to carelessness in handling and planting. With me, autumn planting is preferable. Russian fruits: Only a few of apples, but quite a number of apricots, were planted the past season. The apple remains in doubt as to its success, while the apricot, so far as fruited, may be called a success. Trees were loaded with fruit the past season, while the peach was a failure. Appearances of Kieffer and LeConte pear, so far, have been satisfactory. None are yet in bearing, but from what I have seen I feel willing to try them extensively. The tree is a vigorous grower; the wood ripens early in the season; leaf and bark appear tough and hardy. I think if any pear prove able to resist blight it will be these. Of old standard varieties, I have examined the Bartlett, White Doyenne, Seckel, Sheldon, Howard, and Lawrence. The first two showed no signs of blight. The last four of the list had blighted some. All are standard trees. The results of orchards planted on bottom and upland are in favor of bottom lands, where the trees make best growth and yield the best crops. Apple orchards have been more profitable than any other pursuit in this county. The peach has been worthless for the past ten years, and the pear good as far as tried. Orchardists are extending their plantings. The Wild Goose plum has been a success so far as tried; other varieties are inferior. Cherries are very profitable. The Early Richmond and English Morello are being largely planted, and I would invest capital and labor in the pursuit as profitable, either for family or commercial purposes. Vineyards: In this county, bottom land, surrounded with a timber belt on the south and west, is by far the best location. If on upland, a northeast slope with artificial groves on south and west is most successful. Small fruits: Blackberries do well on high land and bottom. The Kittatinny and Snyder yield well, others are unworthy. Currants succeed on the north side of a wall or fence, or in moist ground with partial shade at least. Gooseberries are indigenous to this soil and climate, and the cultivated varieties succeed remarkably well. Raspberries, both wild and cultivated, are a success. Strawberries are not natural to this locality, as none are found growing wild. A few of the cultivated varieties succeed well on bottom lands. They should have frequent and thorough cultivation, and the ground kept loose and mulched. Of new varieties of small fruits, the Early Cluster blackberry has been tested, but not sufficiently to afford satisfactory conclusions. The Snyder is not as successful as the Kittatinny. The berry is too small, and the plant is no more hardy

on the same ground. Raspberries: A few plants fruited this season, and I am pleased so far. The Souhegan is a vigorous grower, and, if hardy, should esteem it highly. The same may be said of Shaffer's Colossal. Of strawberries, the James Vick is not a success; the Manchester seems promising; the Big Bob is worthless; the Old Ironclad is not productive; Finch and Piper do not succeed. The condition of small-fruit plantations on December 1st, 1884, was good of all classes except the currant. The quince tree seems to grow well, but there are none in this county which have yet come into bearing. We have treated them the same way we have the gooseberry plant. The soil in which they are planted is as various as the number of plants. Miscellaneous: There is a general confidence in this county in the pursuit of fruit-growing, and farmers are generally planting for at least a family supply. Very little attention has been paid to the ornamentation of home surroundings by the planting of shade and ornamental trees, flowering shrubs and plants. The school-house yards in this section are sadly neglected.

COFFEY COUNTY.—By C. H. GRAHAM, LEROY.

Fruits: All classes of orchard trees made a vigorous and healthy growth the past year. The crop in quantity, considering the nature of varieties, of apples, plums and cherries was fair; pears, light; peaches, none. The quality was below the average as compared with preceding years. The condition of all classes of fruit trees on December 1st, 1884, was good. The planting of orchard trees in 1884 was extensive, and scarcely any loss occurred. Spring-time is generally considered the most favorable for planting trees. Blight has been quite prevalent among all classes of pear trees. The results as to upland and bottom-land apple orchards in 1884 showed but little difference in quality or quantity of their product. The pursuit of orcharding has been profitable with apples, plums, and cherries, and I would recommend the investment of capital and labor in the pursuit, for both family and commercial purposes. Cases of failure are easily attributed to want of attention. Small fruits: Blackberries, gooseberries, raspberries and strawberries succeed, while currants are almost a failure. The Snyder blackberry and James Vick strawberry are the most desirable of the newly-introduced varieties. The condition of small-fruit plantations of all classes on December 1st, 1884, was good. The quince, planted in good strong soil, has been a success. Miscellaneous: There is a general confidence in fruit culture in this county, and the farmers are generally planting to supply their families with fruit. There is very little disposition to ornament the home surroundings with trees, flowers, or shrubs, and but few school-house yards in this county have been planted to trees.

(South half.—By Chas. A. Dow, jr., Hartford.)

Fruits: The growth of all kinds of orchard trees was healthy and vigorous. The crop in quantity, considering the nature of varieties, was: Apples, pears, and cherries, 75 per cent.; plums, 50 per cent. of an average crop; peaches failed. The quality, compared with preceding years, was about equal. The condition of all classes of trees on December 1st, 1884, was excellent. Insects injurious to trees were not as numerous as in preceding years. The planting of all classes of orchard trees was more extensive than for several years previous, with very light losses. I can see but little difference in the success in spring or autumn planting. Of newly-introduced varieties of apples, there have been planted the Wolf River, Mann, and Isham Sweet; peaches, the Arkansas Traveler and Wager; plums, Bayley (warranted curculio-proof.) Russian fruits have been planted in this county, but they have not been a success. The Kieffer and LeConte pear have been planted quite extensively, and make a very rapid and healthy growth, but they have not yet fruited. No tendency to blight has been discovered among them. I have quite a number of standard pear trees, ten and twelve years old,

and no blight has occurred among them. On upland the apple tree does not usually grow so rapidly, nor to so large a size, and does not bear so much fruit as on the bottom land. But as more trees can be planted to the acre on upland, the yield per acre would be about the same. Unless the upland is well manured, the fruit will be small, and not so good as on the bottom land. The growing of all kinds of fruits has been profitable when carefully managed, and I would advise the investment of capital and labor in the pursuit for family and commercial purposes. Vineyards: The Concord, Dracut Amber, Ives and Hartford Prolific have been the most profitable varieties. Small fruits: Success has been had with blackberries, raspberries, and strawberries, and they have proven very profitable where carefully managed. The Snyder blackberry has proved perfectly hardy, but the berry is small. The condition of all classes of small-fruit plantations on December 1st, 1884, was good. Miscellaneous: There is a general confidence among our people in fruit culture, and farmers are generally planting for family supply. I do not think there is a farm in this county that has been improved three years that has not an orchard started on it. There is a general disposition to adorn the home surroundings with shade and ornamental trees, flowering shrubs and plants. There are about ninety school districts in this county, and less than a dozen are provided with shade trees.

DOUGLAS COUNTY.—BY D. G. WATT, LAWRENCE.

Fruits: All classes of orchard trees made a vigorous and healthy growth. The crop in quantity, considering the nature of varieties, was: Apples, fair to good; peaches a failure; pear, plum and cherry good. In quality, apples were not as good as those of preceding years; pears about the same; plums rather better; and cherries inferior. The condition of trees of all classes, on December 1st, 1884, was good. Insects injurious to trees and fruit were prevalent. The codling moth and tree cricket have been quite so. Spring-time has been considered the most favorable for the planting of fruit trees. The results of orchards planted on upland and bottom land in 1884, were favorable to the bottom lands, which have produced a better yield and finer quality of fruit than the uplands. The pursuit of orcharding has been profitable of apples, pears, plums and cherries, but not of peaches; and I would advise the investment of capital and labor in the pursuit for family and commercial purposes. Vineyards: Plant on the best land you have, using the Concord, Dracut Amber, and Ives. Train to trellises, and keep well cultivated. Small fruits: Blackberries, on account of the rust which has attacked them in some localities, have not been profitable of late years. Gooseberries have been a success. Raspberries will pay if properly handled. The same may be said of strawberries. The best land on the farm should be used for growing small fruits. The leading varieties of strawberries are the Crescent, Capt. Jack, Cumberland Triumph, Manchester, Miner's Great Prolific, Wilson's Albany, and Sharpless. Of newly-introduced varieties, the Souhegan raspberry has made a good growth, but not yet fruited. The James Vick strawberry produces a small berry; the Manchester yields a fine fruit, though the plant will not stand our climate as well as some others. The Big Bob is a big humbug; the Old Ironclad is worthless. The condition of small-fruit plantations on December 1st, 1884, was good of all classes. The quince succeeds in this county. Miscellaneous: There is a general confidence in fruit culture among the people of this county, and farmers are generally planting for family purposes. There is a general disposition to ornament the home surroundings with shade trees, flowering shrubs and plants.

EDWARDS COUNTY.—BY FRANK E. FULTON, KINSLEY.

Fruits: Apple trees made a medium growth during the season of 1884; peaches and cherries a strong and well-matured growth. Apple trees are too young to fruit. Of peaches, seedlings bore an excellent crop; plums, light. Apple, peach and cherry trees

were in good condition on December 1st, 1884. No insects injurious to tree or fruit have appeared in this locality. The planting of orchard trees in the spring and autumn of 1884 was extensive, and there was but little loss among them; of my own trees, not one died. We prefer spring-time for the planting of fruit trees in this section. Peach trees have done quite well wherever planted, and the crop has been quite profitable. I would advise the investment of capital and labor in the pursuit for family and commercial purposes. Vineyards: A southeastern slope is the most profitable location; Concord, Clinton and Ives are the only successful varieties. These should be planted in spring, and well mulched. The space between the rows should be thoroughly cultivated and all weeds kept down. Small fruits: The blackberry, when properly cared for, has been a complete success; Lawton and Kittatinny are the best varieties. The currant has been a success when planted in rich ground and thoroughly cultivated, and has fruited in the shade of trees. The Red Dutch and the White Grape are the preferred varieties. Gooseberries succeed with the same treatment as currants. The condition of blackberry, currant and gooseberry plantations on December 1st, 1884, was fine and healthy. Garden vegetables—recommended list for extra-early crop: Peas, McLean's Little Gem; radish, Early French Breakfast; beets, Blood Turnip; beans, Black Wax; celery, Early Dwarf; cabbage, Jersey Wakefield; tomato, Acme; lettuce, Premium Cabbage. Second-early crop: Radish, Long Scarlet; cabbage, Flat Dutch; lettuce, Boston Curled; peas, Champion of England; beans, Golden and Early Valentine; potatoes, Beauty of Hebron; sweet potatoes, Yellow Nansemond. Miscellaneous: There is a general confidence in fruit culture in this county, and farmers generally are planting for family supply of fruit. There is a general disposition to plant shade and ornamental trees, flowering shrubs and plants around the home. The school-house yards are in a good condition, and the trees planted thereon look well.

FINNEY COUNTY.—BY F. L. PIERCE, LAKIN.

Fruits: Peach, plum and cherry trees made a vigorous and healthy growth the past season. The cherry tree only produced a crop which was good. The condition of all classes of trees on December 1st, 1884, was good, no disease having developed among them. The extent of planting in 1884 was light, but of these the loss did not exceed 5 per cent. Spring-time is considered the best season of the year for such work. Some few grape-vines have been planted, which have made a good growth and are looking promising. Of small fruits, all classes are doing well. The condition of such plantations on December 1st, 1884, was good of all classes. All sorts of garden vegetables have done well as far as tried. There is a general confidence in fruit culture, and farmers generally are planting for family supplies.

FRANKLIN COUNTY.—BY CHAS. E. TURNER, OTTAWA.

Fruits: The growth of all classes of orchard trees in 1884 was vigorous and healthy. The crop in quantity, considering the nature of varieties, was very good of apple, plum, and cherry; peaches failed, and pears were only a partial success. The quality of apples, plums, and cherries, compared with preceding years, was good; pears poor. The condition of all classes of trees on December 1st, 1884, was excellent. No diseases developed to any extent. The apple was attacked lightly by the twig-blight, peaches by the yellows,\* and pears by blight. Insects injurious to trees were prevalent. To the fruit, the codling moth was more prevalent than ever before. The planting of orchard trees in 1884 was about the same as usual of apples and cherries in extent, of plums more extensive than in other years, peaches light, pears very light. The losses to these plantings were very light, not to exceed 8 to 12 per cent. of the whole, caused by neglect

\*Questionable as to the yellows being in Kansas.—[Sec'y.]

during the season. Spring-time is considered the best season of the year in which to plant fruit trees. Of newly-introduced varieties of fruit, the Kieffier and LeConte pear, and Rogers's seedling plum were planted. Of the Russian varieties of fruit, the old standard apples—Red Astrachan and Duchess of Oldenburg—were planted. The Red Astrachan has not been a success, the other has been commended. No blight has as yet appeared among the pears mentioned. The results as to upland and bottom-land orchards in 1884, indicate a preference for upland locations. Where the orchards have been planted and properly cared for, the apple has been profitable; the peach has borne one or two profitable crops; the plum and cherry have yielded satisfactory returns. Investments in orchards for family and commercial purposes have been quite satisfactory. Vineyards: Plow the land deep, fertilize with barn manure, and lay it out in rows six feet apart; cultivate thoroughly until August each year, but not too deeply; trim to one or two shoots the first year, and thereafter according to the short-spur system. The Moore's Early, Concord, Ives, Lady, and Clinton, are recommended for varieties. Small fruits: Am satisfied that the blackberry can be profitably grown; currants are not a success except in shade and special locations; gooseberries are not profitable to the grower, having failed many years, and prices realized are often very low; raspberries are holding their own in the minds of fruit men, and good prices are received, which encourages them to enlarge their plantations. The demand for strawberries is increasing each year in the local markets, and healthy plantations are a success. Of new varieties of blackberries, the Early Harvest makes a vigorous growth, but has not yet fruited. The Snyder is succeeding; plants are healthy, fruit good and satisfactory. The condition of small-fruit plantations on December 1st, 1884, was very good of all classes. The quince is grown only to a limited extent. Should be thoroughly cultivated for three or four years and fed plenty of ashes and soap-suds. Miscellaneous: The confidence of our people in fruit culture is increasing, and farmers are generally planting for family uses. Among Eastern emigrants, and those having a liberal education, there is a constantly growing disposition to adorn their home surroundings with shade and ornamental trees, flowering shrubs and plants. Our district school-house yards are sadly neglected. They are generally fenced, but otherwise are in a wild state and treeless.

JOHNSON COUNTY.—By E. P. DIEHL, OLATHE.

Fruits: All classes of orchard trees made a vigorous and healthy growth. The crop in quantity, considering the nature of varieties, was of apples 60 per cent., peaches a failure, pears 20 per cent., plums 30 per cent., cherries 25 per cent. of an average. The quality, compared with preceding years, was good of all classes excepting the peach. The condition of all classes of trees on December 1st, 1884, was generally good. Of diseases some twig-blight attacked the apple, and the pear-blight the pear tree. Insects injurious to the tree were prevalent, but not so disastrous to the trees as during the previous year, the only one particularly noticed being the canker worm. The codling moth and curculio affected the fruit to some extent. The planting of orchard trees in 1884 was not so extensive as in preceding years, and the loss occurring was about 15 per cent. The autumn months are generally considered the most favorable for fruit-tree planting. The Kieffier pear and LeConte have been planted in this county, and have generally made a good growth, but have showed a tendency to blight. The old standard varieties of pears have suffered from the attacks of this disease. The results as to upland and bottom-land apple orchards in 1884 indicate a decided advantage in the uplands. The pursuit of orcharding has been a profitable investment in all classes of fruit, and I would advise planters to invest in it for family and commercial purposes. Vineyards: Upland having a northern slope is the most desirable location for the grape-vine. The preferred varieties are such as are found in the voted fruit list of the Kansas State Horticultural

Society. Deep subsoil plowing has its advantages in the preparation of land for a vineyard, and the plants should be set in the fall of the year. Small fruits: All classes have been profitably grown when planted upon upland having sufficient underdrainage. Of the strawberry, the Crescent, Sharpless, Charles Downing, Wilson's Albany, Capt. Jack, Cumberland Triumph, Green Prolific and Glendale, grown in the matted-row system and mulched in the winter, have generally been quite successful. The condition of all classes of small-fruit plantations on December 1st, 1884, was good. The quince tree is successfully grown in this county, its treatment being the same as that given the cherry. Miscellaneous: There is a general confidence among our people in fruit culture, and farmers are generally planting for family uses and adorning their homes with shade and ornamental trees, flowering shrubs and plants. But very few school-house yards in this county are provided with shade trees or other ornamental plants.

LINN COUNTY.—BY J. W. LATIMER, PLEASANTON.

Fruits: All classes of orchard trees made a vigorous and healthy growth in 1884. The crop in quantity, considering the nature of varieties, was about 75 per cent. of an average of apples, 25 per cent. of pears, 50 per cent. of native varieties of plums, and a full crop of cherries, while the peach was a total failure. The quality, compared with preceding years, was better of the apple, plum, and cherry, about the same of pears. The condition of trees on December 1st, 1884, was fine of all classes. No diseases were discovered among them. The canker worm and woolly aphs were the only insects at all alarming in their injuries to the trees, and the codling moth and curculio were most prevalent of those injuring the fruit. The planting of orchard trees in 1884 was about an average of all classes excepting the peach, which was light as compared with preceding years. The loss occurring to these plantings was very light, and generally resulted from the poor condition of the trees used, or carelessness in planting. Of the Russian fruits, a few of the apples were planted, generally obtained of Eastern tree-peddlers. The Kieffer and LeConte pear were planted in this section three years ago. Neither has yet fruited, nor shown any tendency to blight, thus far. Cannot advise their extensive use. Among the older varieties of pear the blight is quite common, and I know of none which are exempt. The Seckel is the least liable, and the Bartlett and Clapp's Favorite most liable. The result as to upland and bottom-land apple orchards, in 1884, showed a greater yield on the uplands, the lowlands having suffered from a late spring frost. The quality of the product of either locality was about the same. Generally the uplands have yielded the best results. The pursuit of orcharding has been profitable in this county of all classes except the peach, and I would advise the investment of capital and labor in the pursuit, for family and commercial purposes. As a rule, carelessness has been the only cause of failure, excepting with the peach, the seasons having been adverse to its success for ten years past. Vineyards: A southeastern slope is the most preferable location, and next a northern slope. The Concord is esteemed the most valuable variety. Vines should be planted in rows six to ten feet apart, and given shallow but thorough culture. Small fruits: The blackberry and gooseberry have been successful; the Kittatiny blackberry is the leading variety. There was a heavy crop of currants the past season, and the prospects are good for a crop the coming season, but it is not generally to be relied upon unless shaded by walls or fences. Of raspberries, the blackcap varieties are reliable, the red varieties are not productive. Strawberries succeed wherever planted and given good attention. The Charles Downing, Captain Jack, Crescent, Kentucky, Boynton and Crystal City are valuable for their qualities. The condition of small-fruit plantations on December 1st, 1884, was good of all classes. The quince, planted in rich, moist soil, which is properly drained, is a success. Miscellaneous: The confidence of our people in fruit culture is increasing, and farmers generally are

planting for family supplies of fruit. The home surroundings are being adorned with shade and ornamental trees, flowering shrubs and plants, while but very few of our district school-house yards have been treated to anything but neglect.

LYON COUNTY.—By J. W. LOY, AMERICUS.

(*North half.*)

Fruits: All classes of orchard trees made a vigorous and healthy growth the past season. The crop in quantity, considering the nature of varieties, was, of apples, pears, and plums, 50 per cent. of an average; cherries, a full crop; peaches, a failure. The quality, compared with preceding years, was good of all classes excepting the plum, which was poor. The condition of all classes of trees was good on December 1st, 1884, excepting the pear, which had suffered somewhat from blight. Insects injurious to tree or fruit were not prevalent. The planting of orchard trees in 1884 was extensive of the apple and pear only. The loss in these plantings was very small. Spring-time is considered the most suitable portion of the year in which to plant. Of the Russian varieties there have been a few of the apples planted, and such as have fruited have given a fine product. The results of upland and bottom-land apple orchards in 1884 did not show any material difference between the two locations, either in quantity or quality of product. The pursuit of orcharding has been profitable in the growing of apples, pears, and cherries, and fairly so with the peach and plum, and I would advise investments in these pursuits for family and commercial purposes. Small fruits: Blackberries, when mulched and cared for, have been successful nearly every year. But few people succeed with currants. My own plants, on a sheltered location and moderately mulched, have for twenty years been a success. Gooseberries do well most anywhere. Raspberries should be mulched, to secure success. Strawberries usually do well, and they too should be mulched. The condition of small-fruit plantations on December 1st, 1884, was good of all classes. The quince has succeeded in this county, with treatment about the same as that given apple orchards. Miscellaneous: There is a general confidence in fruit culture among our people, and farmers generally are planting for a family supply of fruit. They are also adorning their home surroundings with shade and ornamental trees, flowering shrubs and plants. Most of the district school-house yards in this county have been fenced, but none of them have been planted to trees.

(*South half.*—By A. G. Wilhite, Emporia.)

Fruits: With the exception of a little blight in some varieties, all classes of orchard trees made a vigorous and healthy growth in 1884. The crop in quantity, considering the nature of varieties, was about 80 per cent. of an average. Compared with preceding years, the quality was about equal. The condition of trees on December 1st, 1884, was good of all classes excepting the pear and plum. Of insects injurious to tree, only the tent caterpillar appeared on the apple trees. The codling moth was the only one injurious to fruit. The planting of orchard trees in 1884 was extensive of all classes, and attended with a very light loss. Spring-time is considered the most favorable season for planting. The blight appears among most of the varieties of pears grown in this section. The results of upland and bottom-land apple orchards in 1884 revealed but little difference in quantity or quality of the product between the two locations. The pursuit of orcharding has been a profitable investment in the apple and cherry only, and I would advise the investment of capital and labor in the pursuit for family and commercial purposes. Vineyards: The Concord, planted in spring-time upon well-drained land having a porous subsoil, has generally been successful. Small fruits: The blackberry is profitable for family purposes, also the currant and gooseberry; while the raspberry and strawberry have been profitable for market. Well-drained land, having a porous subsoil, is best

suited for their culture. Of strawberries, the Forest Rose, Capt. Jack and Chas. Downing have been the most valuable. They should be set in the spring, kept well cultivated in the early part of the season, mulched lightly through the latter part and the winter; mulch removed in early spring. Of newly-introduced varieties of small fruits, the Early Harvest blackberry made a good growth, but has not yet fruited; the Snyder is too small a berry—the plant is hardy. The Big Bob strawberry is not productive. The condition of small-fruit plantations on December 1st, 1884, was good of all classes. The quince is productive in this locality. It is generally planted in some corner of the yard, and left to care for itself. Miscellaneous: There is a general confidence in the pursuit of fruit-growing in this county, and farmers are generally planting to supply their families with fruit. The home surroundings are being adorned with shade and ornamental trees flowering plants and shrubs. The school-house yards are not fenced, but are open commons.

MARION COUNTY.—By J. B. DOBBS, ANTELOPE.

Fruits: All classes made a very large and healthy growth in 1884. The crop in quantity, considering the nature of varieties, was of apples about 70 per cent., peaches 10 per cent., pears 80 per cent., cherries 90 per cent., of a full crop. The condition of trees on December 1st, 1884, was excellent of all classes. The planting of orchard trees in 1884 was very extensive of all classes, but especially so of apples. Spring is considered the most preferable time for planting. Of the newly-introduced varieties of fruits, the Russian apples were planted, and the Kieffer and LeConte pears. The trees are not old enough yet to determine the value of any of these sorts. Neither of the pears has shown any tendency to blight. The results of upland and bottom-land apple orchards in 1884 would give the preference to uplands, as the most productive; but for seasons prior to 1884, the result has been more favorable to the bottom or second-bottom land. The pursuit of orcharding has been a very profitable investment with the apple and pear, but doubtful as to the other varieties. I would advise investments in this pursuit for family and commercial purposes. Vineyards: Bottom land is a preferable location for vines. Moore's Early, Concord and Goethe have been the most reliable varieties. Miscellaneous: There is a general confidence among the people of this county in fruit culture, and farmers are generally planting for family purposes. Much more was done in 1884 than formerly to adorn the home surroundings with shade and ornamental trees, flowering shrubs and plants. The district school-house yards in this county are naked, without a tree or shrub.

MCPHERSON COUNTY.—By THEODORE BOGGS, MCPHERSON.

Fruits: All classes of orchard trees made a healthy and vigorous growth the past season. The crop in quantity, considering the nature of varieties, was better of apples than ever before, peaches light, pears fair, and plum and cherry good. The quality, compared with preceding years, was No. 1 of apple, peaches hardly an average, pears, plums and cherries good. The condition of trees on December 1st, 1884, was good of all classes, and no diseases were noticeable among them. Insects injurious to either tree or fruit were not prevalent. The planting of orchard trees in 1884 was extensive of the apple and cherry, light of peach, and limited of the pear and plum. The loss occurring to the spring planting was rather heavy—20 to 30 per cent., occasioned by dry weather at the time of planting, and carelessness. Of the Russian varieties included in this season's planting, were the White Transparent apple, and some of the varieties of apricot. They have been successful. The Kieffer pear trees planted in this county did not fruit until this year. The fruit is medium as to size, flavor fine, bears full, and holds on to the tree well. I would recommend their planting. No disposition or tendency to blight



has developed with this pear. The results of upland and bottom apple orchards in 1884 give preference to bottom lands, from the fact that they hold moisture better than the uplands. The pursuit of orcharding is beginning to be profitable with the apple, peach, and cherry, pear not to any great extent, and plum with some varieties. I would advise the investment of labor and capital in fruit-growing for family and commercial purposes. In some, indeed I may say a good many instances, orcharding has proven *unprofitable only* because the trees have been badly neglected. Vineyards: A side-hill or a gradual slope is the preferable location. The Concord is the leading variety, and should be planted in the spring of the year, in rows eight feet apart, and four feet apart in the rows, be given good culture, and not pruned the first year; afterwards a judicious treatment. Small fruits: The blackberry, gooseberry, raspberry and strawberry have been profitably grown in this section. The currant has been unsuccessful wherever planted, without good treatment and shade. I would recommend the use of bottom land or of open upland, good culture, and plenty of mulching, for small fruits. The condition of small-fruit plantations on December 1st, 1884, was good of all classes. The quince is succeeding only to a very limited extent. Garden vegetables are generally successful in this county. Miscellaneous: There is a general confidence among our people in fruit culture, and farmers are planting to supply their families with fruit. There is also a disposition among the majority of the farmers to adorn their home surroundings with shade and ornamental trees, flowering plants and shrubs. A very small portion of our school-house yards have been planted with shade trees.

MIAMI COUNTY.—BY L. BISHOP, OSWATOMIE.

Fruits: Orchard trees of all classes made a vigorous and healthy growth the past season. The crop of fruit in quantity, considering the nature of varieties, was medium of apples, pears, and cherries, and a failure of peaches and plums. The quality, compared with preceding years, was as good as usual. The condition of trees on December 1st, 1884, was good of all classes. Insects injurious to the tree were not prevalent, but there were some species attacking the fruit. The planting of orchard trees in 1884 was not as extensive as in former years; the loss did not exceed three per cent. Spring-time is considered the best season in the year to plant trees. Some of the Russian fruits—apples—have been introduced by tree agents. Trees of the Kieffer pear have been successfully grown, but the character of the fruit is not good, and I do not feel warranted in recommending its planting. I have not noticed any tendency to blight in this locality. Blight was quite extensive among the older varieties of the pear, two years ago. The Seckel, Beurre de Anjou, Beurre Clairgeau, Julienne, Edmunds, Howell, Duchesse de Angouleme, Bartlett, Buffum and White Doyenne are the least liable to attacks of blight; while the Winter Nelis, Vicar of Winkfield, Belle Lucrative, Flemish Beauty, Clapp's Favorite, Glout Morceau, Beurre Diel, Beurre d'Ete, Osband's Summer and Doyenne Boussock have been found most liable to the attacks of this disease—dwarf and standard alike. The results of upland and bottom-land apple orchards, in 1884, give the preference to upland, as well for quality as quantity of product. The pursuit of orcharding has been profitable in the growing of the apple, peach, pear, and cherry, but not of the plum. I would advise the investment of labor and capital in this pursuit, for family purposes, and believe it will pay as well as any branch of agriculture for commercial purposes. Small fruits: All classes have been profitable excepting the currant, which does not generally succeed. The White Grape currant, Houghton gooseberry, Gregg and Tyler raspberry, and Crescent, Longworth Prolific and Jersey Queen strawberries have been the most successful varieties. Of the new varieties, the Snyder blackberry is a vigorous and hardy plant, but the fruit is small. Fay's Prolific currant is satisfactory, but I believe the character generally reputed to it is greatly ex-

aggregated. New varieties of strawberries: The Manchester has been a success; Finch is worthless; Piper is valuable. The condition of small-fruit plantations on December 1st, 1884, was good of all classes. The quince is not entirely successful in this county. It should be mulched and the ground enriched. Miscellaneous: The confidence of our people in fruit culture is pretty general, and there is scarcely a farmer that is not planting for the purpose of supplying his family with fruit. The home surroundings are generally being adorned with shade and ornamental trees, flowering plants and shrubs. The district school-house yards are generally fenced, but contain very few trees.

MORRIS COUNTY.—BY F. B. HARRIS, WHITE CITY.

Fruits: All classes of orchard trees made a vigorous and healthy growth, excepting the pear, which was only medium. The crop in quantity, considering the nature of varieties, was large of apple and cherry, peaches a failure, pear small, and plum medium. The quality, compared with preceding years, was 25 per cent. better of apples, and an average of plums, cherries, and pears. The condition of trees on December 1st, 1884, was good of all classes. No diseases developed excepting the yellows, (?) in a few instances, among the peach trees. Insects injurious to the tree were not prevalent; to the fruit very few, principally the tree cricket and curculio. The planting of orchard trees in 1884 was extensive of apple and cherry, and light of the other classes. Probably 10 per cent. would cover the entire losses. The principal cause was want of care on the part of the nurserymen in delivering their trees in good condition. Spring-time is considered the most suitable time for planting fruit trees. The Kieffer and LeConte pear trees have made a vigorous growth, but are not of sufficient age to fruit. No disposition to blight has developed among them. Of the old standard varieties of pears, most of the trees have been swept away by the blight. The result of upland and bottom-land apple orchards in 1884 was about the same in the quantity of product, but in quality would give preference to that grown on uplands. The pursuit of orcharding has been profitable with the apple and cherry only. I would advise investments in this pursuit for family and commercial purposes. Vineyards: There seems to be very little difference in results which can be clearly traced to difference in the location of vineyards. The Concord and Clinton are preferable varieties; should be planted in spring, thoroughly cultivated through the early part of the season, and mulched during autumn. Small fruits: Blackberries and currants have not been profitable, gooseberries quite profitable, strawberries very profitable, raspberries doubtful. The condition of small-fruit plantations on December 1st, 1884, was good to very good of all classes excepting the currant, which was only fair. The quince is not succeeding in this county. Miscellaneous: There is a general confidence among our people in fruit culture, and farmers generally are planting to supply their families with fruit. The school-house yards are generally treeless; probably 5 per cent. are provided with shade trees.

NESS COUNTY.—BY J. W. BIDWELL, WELLMANVILLE.

I know of no fruit trees in this county, excepting a few peach trees, which have done well, but have not yet fruited. Some of our people are preparing to set fruit trees in the spring.

OSAGE COUNTY.—BY J. G. CLARK, WAVELAND.

(North half.)

Fruits: Orchard trees made a healthy and vigorous growth the past season. The crop in quantity, considering the nature of varieties, was medium of apples, pears, and cherries; peaches, a failure; also plums. The quality, compared with preceding years,

was inferior of all classes except cherries, which was equal. The condition of trees on December 1st, 1884, was good of all classes. Blight developed among some varieties of pears. Insects injurious to fruit were prevalent. The planting of orchard trees in 1884 was about equal to that of preceding years, and the loss was very light. Spring-time is generally considered to be the most favorable season for planting. Of Russian fruits, a few of the varieties of apple were planted. They were not successful, and from my knowledge I do not expect they will be. The Kieffer and LeConte pears were introduced in this section two years ago. I cannot advise the planting of either. I have not seen any blight among them, but have been told that in other sections they have been attacked by it. Of the old standard varieties of pear, the Beurre Diel, Duchesse de Angouleme, Lawrence, Howell and Belle Lucrative are the least liable to attacks of the blight. Next to these, as least liable, are the Bartlett, Buffum, Seckel, Beurre Bosc, and Sheldon. The results of upland and bottom-land apple orchards in 1884, in the Wakarusa valley and greater part of this county, show a preference for uplands as being more productive than the bottoms, and the fruit superior. The pursuit of orcharding has been profitable with the apple, pear, plum, and cherry, but not with the peach, and I would advise our people to plant for family purposes; I would not advise for commercial purposes, because the market prices are not sufficient to pay for the expense and trouble. Small fruits: Blackberries, raspberries and strawberries have been profitably grown, the other classes have not. An eastern exposure is the best for small fruits. Of strawberries, the Glendale, Crescent, Bidwell, James Vick and Finch are the most profitable for market; and the Green Prolific, Sharpless and Duncan are the best for family uses. The Snyder blackberry has fruited with me, and I find it a good variety for one-half of a plantation, and the Kittatinny for the other half. Of the new varieties, the James Vick and Finch strawberry have fruited with me, and give satisfaction in plant and berry. The condition of small-fruit plantations on December 1st, 1884, was good of all classes except the gooseberry. Miscellaneous: Farmers are not, generally planting fruit for family purposes; they are adorning their home surroundings with shade and ornamental trees. The majority of our school-house yards are without shade trees.

*(South half.—By H. Dubois, Burlingame.)*

Fruits: Orchard trees of all classes made a vigorous and healthy growth in 1884. The crop in quantity, considering the nature of varieties, was an average with other years of all classes, excepting the peach and pear, which were failures. The quality compared with preceding years was good. The condition of trees on December 1st, 1884, was equal to other years, which was good. Insects injurious to trees were not prevalent, though a few round-headed apple-tree borers and twig-borers were present. The means used for their extermination was to wash the bodies of the trees with strong soap-suds. Of insects injurious to the fruit, the codling moth has been very bad. The planting of orchard trees in 1884 was extensive of all classes excepting the plum. The loss was not heavy; would not exceed 10 per cent.; probably occasioned by the use of poor trees and bad handling. Spring-time is generally considered the most favorable period of the year for planting. Of the Russian fruits, a few varieties of the apple have been planted, which have been partially successful. The results of upland and bottom-land apple orchards in 1884 are about equal, although through a period of years prior they indicated a preference in favor of the upland. The pursuit, on upland, has been a profitable investment with the apple, peach, and cherry, but not with the other classes. I would advise our people to plant for family and commercial purposes. Small fruits: Blackberry, gooseberry and strawberry have been profitable, the other classes have not. The condition of small-fruit plantations on December 1st, 1884, was good of the blackberry and raspberry only. The quince does not succeed in this county. Miscellaneous: There is a general disposition to plant shade and ornamental trees, flowering shrubs and plants,

to adorn the home surroundings. Not one in ten of our district school-house yards has a shade tree about it.

PAWNEE COUNTY.—By C. C. CHEVALIER, GARFIELD.

Fruits: All classes of orchard trees made a vigorous and healthy growth the past season. The crop in quantity, considering the nature of varieties, was very good of the apple and light of all other classes; the peach was a failure. The quality of all classes was an average, as compared with preceding years. The condition of trees on December 1st, 1884, was good. The planting of orchard trees in 1884 was extensive. Autumn is generally considered the best season for the planting of fruit trees in this location. Upland locations are preferable. Garden vegetables: All classes of garden vegetables are successful in this county, when properly cultivated. Miscellaneous: The confidence of our people in fruit culture is not general, but is confined to a few, and farmers are not generally planting to supply their families with fruit. But there is a general disposition to plant shade and ornamental trees, flowering plants and shrubs, to adorn their home surroundings. Our school-house yards are not provided with shade trees.

RENO COUNTY.—By J. J. MEASER, HUTCHINSON.

Fruits: All classes of fruit trees made a good and healthy growth the past season. The quantity of the crop, considering the nature of varieties, was much better than the year previous of all classes. The quality, compared with preceding years, was equally as good. The condition of trees on December 1st, 1884, was good of all classes. Insects injurious to tree or fruit were not prevalent. The planting of orchard trees in 1884 was extensive of the apple and peach, and light of the other classes. But very few trees failed to grow — perhaps 2 to 5 per cent. of the planting — which resulted from careless handling. Spring-time is generally considered the most favorable season for planting. Of the new or recently-introduced varieties, the Mann, Wolf River, Isham, Guilford Sweet and Ingraham apples were planted. Of the Russian fruits, apricots have been planted to some extent. The older trees have given a good product, and have borne successfully, even in such years as the peach has failed. They commence bearing at three years old. The Kieffer pear trees, which were planted this spring — and I do not know of any others — have made a vigorous growth, but whether they are true to name we cannot yet determine. Those of this variety which are claimed to be dwarfs have been attacked with the blight; the standards have not. No blight has occurred to any other pear trees in this section. The results of upland and bottom-land apple orchards in 1884 do not indicate any preference in quantity of the product, nor in the quality. The pursuit of orcharding has been profitable with all classes of fruits, and I would advise the investment of labor and capital in fruit-growing for family and commercial purposes. Vineyards: The vine succeeds in any location which will grow a good corn crop. The Concord, planted in spring and given good culture during the fore part of the season, trained to stakes or wire trellis, has generally succeeded. Small fruits: Of newly-introduced varieties of small fruits, the Snyder blackberry has given satisfactory results the past season. Raspberry plants are in good condition. Miscellaneous: The people have awakened to the idea that fruits will grow here as well as in the eastern part of the State, and farmers in general are investing whatever they think they can risk in this pursuit. The disposition to plant shade and ornamental trees, flowering shrubs and plants, to adorn the home surroundings, is growing in favor, and many are planting. Very few of the district school-house yards, to my knowledge, have been provided with shade trees.

RICE COUNTY.—By DR. G. BOHRER, CHASE.

*(North half.)*

Fruits: The growth of all classes of orchard trees the past season was vigorous and healthy. The crop in quantity, considering the nature of varieties, was good of apples and pears, poor of the peach, and medium of plums. The quality, compared with preceding years, was fully as good as usual of apples and cherries, inferior of peaches and pears, and not so good as common of plums. The condition of trees on December 1st, 1884, was healthy of all classes. Insects injurious to fruit were only the curculio in the peach. The planting of orchard trees in 1884 was extensive of all classes, and the loss incurred very light. Autumn is generally considered the best season of the year for planting. A few of the Russian varieties of apples were among the plantings the past season. The Kieffer pear trees planted two years ago have escaped attacks of the blight so far. The results of upland and bottom-land apple orchards in 1884, afford but little preference as to locality. Orchardng has been a profitable investment with all classes, and I would advise the planting of fruits of all kinds for family and commercial purposes. Small fruits: All classes have done well excepting the blackberry, the plants of which are killed some winters, and the older varieties of the currant. The native black currant is a success. I would recommend, as the most suitable location for small fruits, the northern side of a hedge or protection of some kind. Of strawberries, the most successful variety, so far as I have been able to learn, is the Crescent. The condition of small-fruit plantations on December 1st, 1884, was good of all classes, so far as I have been able to ascertain. Miscellaneous: There is a general confidence among our people in fruit culture, and farmers are generally planting to supply their families with fruit, and to adorn the home surroundings with shade and ornamental trees, flowering plants and shrubs. Only a few of the district school-house yards in this county have been provided with shade trees.

*(South half.—By J. B. Schlichter, Sterling.)*

Fruits: All classes of fruit trees made a vigorous and healthy growth the past season, excepting the peach, which was not as healthy as formerly. The crop in quantity, considering the nature of varieties, was full, of apples, pears, and cherries, and a partial failure of the peach and plum. The quality, compared with preceding years, was an average of apples, pears, and cherries, and inferior of peaches and plums. The condition of trees on December 1st, 1884, was good of all classes excepting the peach, which was only fair. Insects injurious to tree were the scale-louse on the Sand Hill plum and smaller twigs of the cherry, and the canes of the grape and raspberry. Those injurious to fruit were the curculio in the peach and plum, and a few of the codling moth in the apple. The planting of orchard trees in 1884 was extensive of the apple and peach, and light of the pear and plum. The loss incurred did not exceed ten per cent., and was caused by carelessness in handling. Spring-time is generally considered the best for tree-planting. Of the Russian fruits, a few varieties of the apple and apricot were planted. A few of the Kieffer pear have been planted in this section, but none have fruited yet. No blight has yet been discovered attacking these pear trees. The pursuit of orcharding has been a profitable investment in all classes excepting the pear. Small fruits: Blackberries require thorough cultivation from early spring through the entire growing season; as a result, you may look for a paying crop. A heavy crop was produced the past season. Currants have not been successfully raised in the county up to this time. In moist, clay soil, on the north or east side of a fence, they will probably succeed. Gooseberries are a heavy crop. Raspberries are still badly injured during winters, and the crop was a partial failure. Strawberries gave a very full-crop of fine berries. For small fruits, I would recommend flat, loamy soil, protected from south winds. The varieties of straw-

berries succeeding are the Charles Downing, Crescent, Glendale, Sharpless, Manchester, and Mount Vernon. They should be grown in matted rows, four feet apart, running east and west. Mulch in November, and leave the mulching on until the bearing season is over. Of the newly-introduced varieties, the Early Harvest blackberry has produced an abundant crop, and the plant has proved hardy; its berry is solid, but small. The crop is all gone by the time the Kittatinny begins to ripen. The Snyder blackberry produces an abundant crop, and the plant is hardy, but the berry is small. The Souhegan raspberry is early and productive, ripens evenly, and the fruit is past by the time the McCormick is in season. Of strawberries, the James Vick is a vigorous plant, but it has not fruited here as yet. Manchester fruited the past season, and from appearances, this season it should stand first among all the new varieties, being productive and yielding uniformly-large berries; stands No. 1 in my list. Big Bob is a late bloomer and vigorous grower; ripens with the Charles Downing; is very productive and quite promising. The Oliver Goldsmith is in season at the same time as the Charles Downing; plant hardy, leaf very large, productive, and resembles the Sharpless; stands No. 2 on my list. Mrs. Garfield is a promising variety. The Old Ironclad plant is very large, equal to the Glendale; fruits heavier; stands No. 8 in my list. The Mount Vernon is very productive, later than the Glendale, and stands No. 5 in my list. The plant of the Primo is subject to rust. The Sharpless stands No. 6, and the Cumberland No. 7, in my list. Piper is an early-ripening fruit; the plant is productive, hardy, and vigorous; stands No. 9 in my list. The condition of small-fruit plantations on December 1st, 1884, was good of all classes excepting the currant. The quince is succeeding in this county. Have given them no attention except to enrich the ground. It has not yet fruited. Garden vegetables—recommended list for extra-early crop: American Wonder pea, Jersey Wakefield and Winningstadt cabbage, Black Wax bean, Early Bassano beet, Boston Curled lettuce, Button onion, Stowell's Evergreen corn, French Breakfast radish, Early Ohio, Early Rose, and Beauty of Hebron potato, White Flat Dutch and Purple Top turnip. For second-early crop, same varieties planted later in the season, adding the Philter Krout and Drumhead cabbage, Mammoth Pear, Late Beauty of Hebron, Grange and Matchless (or White Neshannock) potato, and Lima beans. For a general crop, plant the same varieties, but later in the season. My theory is, to have a good crop of valuable quality it should be grown quickly; hence, sow early-maturing kinds late in the season, in rich ground, for a general crop. Miscellaneous: There is more general confidence throughout this county in fruit culture than has heretofore existed, and farmers in considerable numbers are now planting, but there is still a large number who are not. The disposition to adorn the home surroundings with shade and ornamental trees, flowering shrubs and plants, is not yet general, but it is on the increase each year. The attempt has been made to plant shade trees on about one out of every twenty-five school-house yards in our county. Being Superintendent-elect, I intend to encourage the beautifying of school yards as far as possible in the future.

RUSH COUNTY.—By DR. WM. GOODWIN, LACROSSE.

Fruits: All classes of orchard trees made a healthy and vigorous growth; very few are old enough to fruit. Peach trees have borne lightly, while the other classes have produced a few specimens each. The condition of trees on December 1st, 1884, was good of all classes. The planting of orchard trees in 1884 was not very extensive of any class. Bottom lands in this county are inferior for all purposes. From past results, I would advise our people to plant fruit trees for family and commercial purposes. Vineyards: Upland, having a northern slope, is preferable. All kinds of grapes which have been planted have done well when well cultivated and kept clear of weeds. Small fruits: Blackberries can be made a success; currants are doubtful; while the gooseberry and

strawberry have been successful. With proper attention the culture of garden vegetables has been successful. Miscellaneous: Our people have not a general confidence in this part of the country in fruit growing, but people who are able to purchase trees are planting, and are adorning their home surroundings with shade and ornamental trees.

STAFFORD COUNTY.—By C. G. McNIEL, STAFFORD.

Fruits: Orchard trees of all classes made a vigorous and healthy growth the past season. The crop in quantity, considering the nature of varieties, of peach and plum was full, cherry light; of the other classes the trees were not old enough to fruit. The quality compared with other years was good of all classes above mentioned. The condition of trees on December 1st, 1884, was healthy. No insects were found injuring the trees, except the borer. None injurious to fruit have appeared in this locality. The planting of orchard trees in 1884 was extensive of all classes. The losses, which exceeded 5 per cent., were occasioned by neglect. Spring-time is generally considered the most favorable season for planting. Of the Russian varieties of fruit, a few of the apricot have been planted, and are succeeding. Very few trees of the Kieffer and LeConte pear have been planted; none have fruited. They show no tendency to blight. From the experience of past years, upland locations are preferable for orchard trees. The pursuit of orcharding has been profitable of all classes, and I would advise our people to invest in this pursuit for family and commercial purposes. Vineyards: Upland sandy locations, with good wind-breaks, are preferable. The old reliable Concord, with a few fancy varieties for family use, would be the most desirable list. They should be planted in land deeply prepared for at least one year before using, and should be given clean culture and mulching for two years, training to a stake or wire trellis. Small fruits: All classes of small fruits should be sheltered to a certain extent, and kept thoroughly cultivated. The condition of small-fruit plantations on December 1st, 1884, was good of all classes. The quince is not succeeding in this county. Miscellaneous: There is a growing confidence in fruit culture with our people, and many farmers are planting for a family supply, and their success will lead others to do likewise. Ornamentation of the home surroundings with shade trees, flowering shrubs and plants is not general, but the desire to do so is increasing. Very little has been done in the way of providing shade trees for our school-house grounds.

WABAUNSEE COUNTY.—By H. A. STILES, PAVILION.

All classes of fruit trees made a healthy wood growth in 1884, except some of the pear, which were injured by blight. Apple and pear produced a fair crop; cherry heavy, of superior quality; plum, light crop of good quality; peach failed. The condition of trees on December 1st, 1884, was good to best. Insects injurious to the tree were not prevalent, but to the fruit they were. I am not aware of any means used for their extermination. Apple trees were quite extensively planted, but of other classes less than usual. A loss of about 20 per cent. occurred, caused mainly by neglect. From past results I would recommend spring-time as the most favorable season for planting. Of new varieties, several of the Russian apples and apricot, and Kieffer and LeConte pear, were set out; but as none of these have yet fruited, I cannot speak of their profitability. I however believe these pears will be worthy of cultivation. Neither has shown any signs of blighting. This disease has occurred most injuriously among my Bartletts. I did not observe much difference in quality of the product of apple orchards in 1884 as between lowlands or uplands, but the lowlands produce the heaviest crops. I prefer the medium altitudes, which afford the best results. Estimating the product of years prior, bottom lands have been the most profitable. Apple, cherry and pear (where exempt

from blight) orchards have been a profitable investment; other classes are not. I would recommend planting for family and commercial purposes where proper conditions are obtainable. Vineyards: It is hardly possible to find a location where the grape-vine will not succeed if properly cared for, excepting very wet lands or dry high points. I would plant in spring, on land having a deep soil and deeply plowed, in rows ten feet apart and eight feet in the row; train on three-wired trellis. Avoid a continuance of old wood as much as practicable. Cultivate often and shallow. Use well-rotted manure, and pinch back the cane-growth in summer. I prefer the Worden, Champion, Concord, and Catawba; the first two do better than the Concord. Small fruits: Blackberries are very reliable, bearing a fair if not a large crop every year, and requiring but little labor or expense. Currants are a desirable fruit, but not profitable; can be grown quite successfully. Gooseberries have been, but are no longer, a profitable fruit; mildew is its worst enemy. Raspberries are sure and profitable if well manured; should be cut back each year and cultivated in fore part of the season. Strawberries are less reliable, but may be profitably grown. New varieties: The Snyder blackberry is a remarkably hardy and productive variety, and so far has given satisfaction. The condition of small-fruit plantations on December 1st, 1884, was good of all classes excepting the gooseberry, which was only fair. The quince is partially a success when the soil is treated to an application of salt and wood ashes sparingly. Miscellaneous: The confidence of our people in fruit culture is strengthening, but many are still indifferent. Most of the farmers are planting for family use, but in many cases too sparingly. To some extent the homes are being made attractive by surrounding them with shade and ornamental trees and flowering plants, and it is gratifying to notice an increasing interest in this direction. Many of the school-house yards are entirely destitute of shade or ornamental trees.

(By Abner Allen, Wabamsee.)

Fruits: The growth of all classes of fruit trees was unusually vigorous and healthy in 1884. The crop of fruit in quantity was as follows: Apples 45 per cent., pears 70 per cent., plums very light, cherries 50 per cent., of an average one. Peaches failed. The quality as compared with preceding years was not an average of apples, superior of pears and plums, and an average of cherries. The condition of all classes on December 1st 1884, was sound with the exception of a few instances of twig-blight on apple, and light attack of the blight to pear trees. Insects injurious to tree were not troublesome; to the fruit, the codling moth and wasps. The destruction of the winter quarters of these species is my favorite method for extermination. The planting of orchard trees of all classes was extensive in 1884, excepting the plum, which was comparatively light. Losses were unusually light, not exceeding two per cent. Spring is considered the most favorable season for planting in this locality. Of the new varieties of apples, were planted Langford and Ingraham; peaches, Winsted, Virginia Monarch, and October Beauty; pears, Kieffer, Garber, Smith's Bordeaux, LeConte, and Frederick Clapp; plums, Weaver and Bassett; cherry, Dyehouse. Russian fruits—apples and apricots: Many varieties are on trial, and have not yet developed any valuable qualities either in tree or fruit. Kieffer pear trees are making a vigorous and healthy growth; have not yet fruited. LeConte pear trees seem to be somewhat tender, and have suffered lightly from blight. Of the older varieties, some are entirely killed by this disease. The varieties least exempt are, Louise Bonne de Jersey, Beurre Diel, Buffum, and Bartlett. Most exempt, Beurre de Anjou, Seckel, Philadelphia. Apple orchards on bottom lands produced the best crop in 1884. As to the quality, some varieties develop the greatest excellence on upland, while others do best on bottom lands. Estimating the product for years prior to 1884, orchards on bottom lands were the most profitable. The pursuit of orcharding has been profitable with all classes except the peach, and it is safe to follow it for family and commercial purposes. Vineyards—list of varieties: The Worden, Concord, Lady, Elvira,



Martha and Delaware are preferred varieties, to be used in a general culture. Small fruits: All classes are successfully grown. New varieties: Currant, Fay's Prolific, fruited the past season; may prove equal to some of the old sorts. Raspberry, Shaffer's Colossal, fruited two years; berries of immense size, canes not entirely hardy. Strawberry, Manchester is prolific, vines rust, quality of fruit poor; Big Bob, fruit only fair, not desirable; Finch, so far of no value; Piper, a promising sort. The condition of small-fruit plantations on December 1st, 1884, was good of all classes. The quince has succeeded in sheltered locations, on clay or clayey loam, cultivated during summer, and mulched during winter. Garden vegetables—for an extra-early crop: Peas, Landreth's Extra Early, Early Kent; beets, Egyptian, Early Turnip; potatoes, Early Ohio, Extra-early Vermont; cabbage, Early York; turnip, White Top Strap Leaf; cauliflower Early Paris; tomato, Acme; radish, Scarlet Turnip; corn, Early Minnesota. For second-early crop: Use the foregoing, planted later, and substituting the cabbage, Early Winningstadt; potato, Ontario, Peerless; sweet potato, Yellow Nansemond; corn, Egyptian, Stowell's Evergreen. Miscellaneous: There is a confidence with the people in the success of all classes of fruit excepting the peach, and farmers are generally planting for a family supply. I believe there is a general desire among the people to adorn home surroundings as much as their means will permit. I regret to have to say that very few of the school-house yards in the county are ornamented in any way.

## SOUTHERN FRUIT DISTRICT.

ALLEN COUNTY.—By C. C. KELSEY, HUMBOLDT.

Fruits: All classes of orchard trees made a good, vigorous growth the past season. The crop, considering the nature of varieties, was good in quantity, and in quality equal to the preceding years. The condition of fruit trees on December 1st, 1884, was good. No disease developed among any trees, except considerable blight to pear trees. Insects were not more prevalent than usual. The planting of apple trees was extensive in the spring and autumn of last year; peach, pear and plum were planted lightly. The loss among these plantings was about 20 per cent., and resulted from inattention and want of care at the time of planting. Spring-time is preferred for the planting of fruit trees. There have been no varieties of Russian apples planted during the season, excepting the old standard sorts. The Kieffer pear has not fruited here, but the trees are apparently healthy; and the same may be said of the LeConte variety. Neither has yet shown any disposition to blight in the tree. Indeed, very little blight has occurred to any class or kind of pears planted in this section. The product of the past year would indicate a preference for bottom lands, as being the most profitable for orcharding. Apples and cherries have been a profitable investment in the hands of a careful manager, while peaches, pears and plums have not. I would advise such investments of capital and labor for either family or commercial purposes. Vineyards: The varieties which have proved most preferable for this section are the Concord and Elvira. Planting in spring-time, upon deeply-plowed land, followed by thorough cultivation and mulching, has generally been successful. Small fruits: Blackberries require good ground and deep cultivation. Planted in rows of sufficient distance not to interfere with culture, they have been a success. The same may be said of the currant, the gooseberry, the raspberry, and the strawberry. Of the varieties of blackberries, the Snyder has been a success, except in drouthy seasons. Of new varieties of strawberries, the Manchester has proven desirable, while the Big Bob is pronounced a humbug. The condition of small-

fruit plantations on December 1st, 1884, was good of all classes. The quince has generally succeeded, especially upon uplands. Miscellaneous: There is a general confidence in fruit culture in this county, and farmers generally are planting for family supplies of fruit. There is also a general disposition to plant shade and ornamental trees and flowering shrubs, and to adorn the home surroundings. The school yards are generally neglected, and are not made attractive or pleasant to pupils by shade or ornamentation.

BOURBON COUNTY.—BY M. J. BECKER, FORT SCOTT.

Fruits: All classes of orchard trees made a good and healthy growth. The apple crop, considering the nature of varieties, was about 25 per cent.; pear, 40 per cent.; plum, 50 per cent.; cherry, 25 per cent. of an average crop; peaches, a total failure. In quality, the apple was very much inferior; pear, poor; plum, not as good; cherry, somewhat inferior to that of the preceding year. The condition of trees on December 1st, 1884, was good of all classes. No diseases developed among them. Insects injurious to tree or fruit were less prevalent than in preceding years. No special means have been used for their extermination. The planting of apple trees during the past season was greater in extent than of any other class of fruit; of peach and plum, an average of other years; while of pear it was below an average. The loss of these plantings did not exceed 10 per cent. of the whole. The cause is easily traced to carelessness in planting. \*Spring-time is preferred for the planting of fruit trees in this section. Of Russian fruits, the Tetofsky apple, and what is generally known as the Russian apricot, have been planted, but are not of sufficient age to fruit; therefore their merits have not been determined. The Kieffer and LeConte pear have been introduced to this section, and have so far escaped the attacks of the blight. Of other varieties, the Glout Morceau, Vicar of Winkfield, Flemish Beauty, White Doyenne and Louise Bonne de Jersey are least liable to attacks of the blight. The best yield of fruit of apple orchards has been obtained from bottom lands, but the best quality of product from uplands. The pursuit of orcharding has been a profitable investment in the hands of careful managers in this section, and I would certainly recommend the investment of capital therein, both for family and commercial purposes. Last season our orchards yielded a profitable crop, and all kinds of fruit brought a fair price in the market. This season the quantity was less, the quality not so good, and the price lower; especially for fall and winter fruit. The want of a good shipping market, or establishment for preserving the fruit, are the main causes for discouragement. Small fruits: Blackberries succeed where well manured, kept free from weeds, and the soil covered with hay, leaves, &c., for a mulch. Currants only succeed partially, and very few are under cultivation in this county. Of gooseberries, the Houghton succeeds the best. Raspberries generally do well where they receive good treatment. Strawberries are a success. Of the new varieties of strawberries, the Manchester has proven desirable, while the Big Bob is considered worthless. The condition of small-fruit plantations on December 1st, 1884, was good of all classes. The quince does not fully succeed in this county, although given the same character of treatment bestowed on other fruit trees. Miscellaneous: There is a general confidence in fruit culture. Farmers are generally planting for family supplies, but more largely of apples and cherries than of other classes. School-house yards are generally neglected. In a few instances trees have been set out, but they are suffering for needed care.

BUTLER COUNTY.—BY W. H. LITSON, BENTON.

Fruits: All classes of orchard trees made a vigorous and healthy growth the past season. The crop in quantity, considering the nature of varieties, was: Apples, pears, and cherries, fair; peach, light to full, as to locality; plum, very light. The quality,

compared with preceding years, was good of all classes. The condition of trees, on December 1st, 1884, sound and healthy. Insects injurious to tree or fruit were not prevalent during the season. The planting of apple trees was extensive; of all other classes moderate, and attended with very little loss. Spring-time is considered preferable to autumn for planting. A few Kieffer pear trees have been planted, which have not yet fruited. Of the Russian varieties of fruits, the apple and apricot have been planted, but not sufficiently tested to determine their merits. Blight has not been prevalent. From the results of apple orchards planted upon uplands and bottoms, no marked difference has been discovered as to quantity or quality indicating a preference for either locality. The pursuit of orcharding has been a fairly profitable investment in the hands of the planters. Small fruits: The Kittatinny blackberry, Houghton gooseberry, blackcap varieties of raspberry, and most of the varieties of strawberry (the Chas. Downing and Crescent especially), have been successfully planted. The currant has failed. The condition of small-fruit plantations, on December 1st, 1884, was good of all classes. Garden vegetables—recommended list for extra-early crop: Beets, Bassano; carrot, Early Horn; lettuce, Early Curled Simpson; peas, Daniel O'Rourke and Extra Early; potato, Early Rose; radish, Long Scarlet Short-top; squash, Bush Scalloped; turnip, Early Flat Purple-top. Second-early crop: Bean, Red Valentine; beet, Early Blood Red Turnip; cabbage, Early Winningstadt; carrot, Harvey Long; sweet corn, Stowell's Evergreen; cucumber, Long Green; peas, Early Kent; radish, Early Scarlet Turnip. For a general crop: Beet, Blood Turnip; cabbage, Flat Dutch and Drumhead; carrot, Harvey Long; sweet corn, Stowell's Evergreen; cucumber, Long Green; melon, Nutmeg; watermelon, Ice Cream; onion, Large Red Wethersfield; parsnip, Hollow Crown; peas, Champion of England; tomato, Trophy, Acme, and Paragon; turnip, Red-top Strap Leaf. Miscellaneous: There is a general confidence in fruit culture, and farmers are generally planting for family purposes, and adorning their home surroundings with ornamental trees, flowering shrubs and plants. Most of the school-house yards in this county are in a disgraceful condition; only two to four per cent. have shade trees fairly cared for.

(By Harvey Fenton, Indianola.)

Fruits: Orchards of apple, peach, pear and cherry trees made a very healthy growth the past season, while plum trees grew most vigorously. The crop, considering the nature of varieties, of apple and cherry, was very good in quantity; of peach, light; plum, moderate. In quality, the apple and cherry were better than in preceding years, while the peach and plum were not as good. The condition of fruit trees on December 1st, 1884, was good of all classes. No new diseases developed during the season. Insects injurious to tree: The handmaid moth and flat and round-headed borers were prevalent. The first were largely hand-picked and killed, while the borers were not as thoroughly dealt with as they should have been. Insects injurious to fruit were not alarmingly prevalent. The planting of orchard trees in the spring and autumn of 1884 was not extensive, and the loss was correspondingly light, resulting largely from a lack of proper cultivation and insufficient rainfalls. Spring-time is universally considered the best for planting fruit trees. Many varieties of Russian fruits have been planted, but no record has been kept of their names. Some varieties have done well. Some few Kieffer and LeConte pears have been planted, and made rank growth, but have not fruited as yet. There has been no disposition to blight among them, though now four years old. Most all other varieties of pears have been injured by blight. The results, in quantity of product, of apple trees planted on upland and bottom land, indicate the bottom land to be the best location. The pursuit of orcharding, when properly managed, has been profitable with apple, plum, and cherry, but not encouraging with peach. No one should neglect to have an orchard for family use, and there is ample

encouragement for planting for commercial purposes. All who have invested in the pursuit of fruit-growing have found it profitable, where they have given anything like reasonable attention to it. Vineyards: Vines should be planted in spring-time, on well-prepared upland soil, and thoroughly cultivated during the fore part of the season, and mulched during the latter part. The Concord and Dracut Amber are preferable to other varieties. Small fruits: Blackberries, gooseberries, blackcap raspberries and strawberries have been successfully and profitably grown, while the currant has not been sufficiently tested. Of raspberries, the Turner, a red variety, has proved to be an absolute failure. For strawberry culture, select a situation that will readily drain itself, thoroughly prepare it before planting, use the Crescent, Captain Jack and Chas. Downing in planting, cultivate thoroughly, and mulch to keep the ground in good tilth. The Snyder blackberry has been a success. The condition of small-fruit plantations on December 1st, 1884, was good of blackberry, gooseberry, and strawberry; of raspberries, rather doubtful. Garden vegetables—recommended list for extra-early crop: Peas, American Wonder, McLain's Little Gem; lettuce, Philadelphia Early White; radish, French Breakfast; rhubarb, Linneus; beans, Black Wax; tomato, Acme. General crop: Peas, Champion of England; potato, Beauty of Hebron; onion, White Club; sweet corn, Stowell's Evergreen; cabbage, Jersey Wakefield and Flat Dutch. Miscellaneous: There is a general confidence in fruit-culture, and farmers everywhere have an orchard of some kind and are planting additions each season. There is a general disposition to plant shade and ornamental trees, flowering shrubs and plants, to adorn the home surroundings. The district school-house yards are sorely neglected, but school yards in cities are being considerably improved.

CHEROKEE COUNTY.—By O. N. WILLIAMS, COLUMBUS.

(North half.)

Fruits: All orchard trees made a healthy but not vigorous growth the past season. Considering the nature of varieties, the crop of early apples was, in quantity, light and poor; fall and winter, light but good. Peaches and pears failed; plums, light; cherries, a large crop, especially of the Early Richmond variety. The quality, compared with preceding years, was not so good of apples and plums, but better of cherries. The condition of trees on December 1st, 1884, was good of all classes, and no disease developed among them. Of insects, the curculio was quite prevalent in the plum. The planting of orchard trees in the season of 1884 was fair of apples, but very light of the other classes. The loss occurring in spring planting was about 15 per cent. Of new or recently-introduced varieties of apples, there have been planted the Lawver, Arkansas Black, and Shockley; of peaches, the Henrietta, Wheatland, and Fowler's Early; of pears, Kieffer and LeConte; of plums, Golden Beauty and Blackman. Russian fruits have been planted in a small way, but have not been sufficiently tried to determine their adaptation or value to this section. The Kieffer and LeConte pears have not yet fruited, but the trees are remarkably healthy, and have shown no inclination to blight. These trees are now four years old. Of the other varieties of pears, the Duchesse de Angouleme and Louise de Bonne Jersey, as dwarfs, are least liable to attacks of blight. The results of apple orchards, on upland and bottom land, favor the bottom land, both in quantity of product and quality. The pursuit of orcharding has been profitable in the hands of careful managers, with all classes of fruits excepting the peach; and I would advise the investment of capital and labor in this direction. Peaches have failed mostly from late frosts in spring, and the fruit-buds are sometimes killed by the severe cold of winter. Vineyards: The most suitable locations recommended are such as have a northwestern slope, and should be planted early in spring, though good success has been had with fall planting. The Concord, Dracut Amber, Moore's Early Senasqua, Lady, Martha, Cyn-

thiana and Sheldon are preferable varieties, and should be trained on the trellis system, as it gives the best results. Small fruits: Blackberries, gooseberries, red varieties of raspberries, and strawberries, have been profitably grown. Currants are not profitable, as they require protection from the heat of the sun. The best locations are those which are well drained and have a rich soil. Of new varieties of fruits introduced, the Snyder blackberry is hardy, but it is too small a berry. The Kittatinny is also hardy, and is a much better fruit. The Souhegan raspberry is small, but as good as any blackcap variety. The Shaffer Colossal is a good variety. Of strawberries, the James Vick and Finch are good varieties, the Manchester is only fair, and the Big Bob is worthless; the Ironclad and Piper are first class. The condition of small-fruit plantations on December 1st, 1884, was good of all classes excepting the currant, which was only fair. The quince does not fully succeed in this county, though special treatment has been rendered it. Miscellaneous: There is a general confidence in fruit-culture, and farmers are generally planting for family supply. There is a general disposition to plant shade and ornamental trees, and to adorn home surroundings with flowering shrubs and plants. Very little attention has been paid to the ornamentation of our school-house yards.

*(South half.—By Thomas W. Smith, Baxter Springs.)*

Fruits: Orchard trees made a vigorous and healthy growth the past season. The crop in quantity, considering the nature of varieties, was: Apples, 25 per cent. of an average; peach, failure; pear, 16 per cent.; plum and cherry, full. The quality, compared with preceding years, was, of apples and pears, inferior; of plums and cherries, equal. The condition of trees on December 1st, 1884, was good of all classes except pear, which suffered some from blight. No other disease developed among the trees. Insects injurious to the tree or fruit were not prevalent. The planting of apple, peach and plum trees was extensive during the season of 1884, but not so of the pear. The loss which occurred in the spring planting was about 25 per cent., caused by the ground being wet and followed by very dry and warm weather later in the season. From results, fall is the most desirable season for planting trees. Of Russian varieties of fruits, apples and apricots have been planted. Neither of these has been very successful. The Kieffer and LeConte pear have also been planted in this section, but too recently to permit of any conclusion as to their adaptation or the value of their fruit. I know of no tendency among these trees to blight. The results of upland and bottom-land apple orchards in 1884, would indicate a preference for uplands; but for years prior to 1884, would favor lowlands. The pursuit of orcharding has been profitable in the hands of careful managers, and I would advise the investment of capital in the pursuit. Fruit-growing has been profitable thus far, but an immense number of trees have been planted, and the question will be hereafter as to a market for the immense product, when the trees come into full bearing, as they soon will. Vineyards: A northeast slope is preferable for a location. Concord is the most desirable variety. Plant in rows six feet each way, and train on stakes, cultivate well, and it will afford satisfactory results. Small fruits: All classes excepting currants are successful, and should be planted on well-drained lands. The condition of small-fruit plantations on December 1st, 1884, was good of all classes. The quince does well in this section, planted on rich land, and deeply cultivated. Miscellaneous: There is a general confidence in fruit culture. The farmers are nearly all planting orchards for family supplies, and in ornamentation around their dwellings are using fruit trees for the double purpose of fruit and shade. Very little effort is being made to provide the school yards with shade and ornamental trees.

## COWLEY COUNTY.—By R. J. HOGUE, WINFIELD.

Fruits: All classes of orchard trees made a vigorous and healthy growth the past season. The yield of apples and peaches was more than an average with other years; pears medium, and plums good. We had the heaviest crop of cherries since the planting of trees in this county. The quality, as compared with preceding years, was: Apples, good; peaches, medium; pears, plums and cherries, very fine. The condition of all classes of trees on December 1st, 1884, was sound and healthy. No disease developed among them, except blight in the pear. Insects injurious to either fruit or tree were not prevalent. The planting of orchard trees in the spring and autumn of 1884 was more extensive than in any season previous, with not to exceed 10 per cent. of loss, which was owing to the use of damaged stock and late planting in spring. Autumn is generally considered the best season of the year to plant. Of Russian apples—at least so called—a few have been planted; apricots, a very few, which have been a success in growth. The Kieffer and LeConte pear have been planted, and have made a good growth, but have not as yet fruited. There have been no indications of blight among them. Of old and standard varieties, the Seckel has the least tendency to blight, and the Bartlett is the most liable. The product of bottom and upland orchards, in the season of 1884, was better in quantity on the bottom lands, but the quality was superior on the uplands. The pursuit of orcharding has been profitable in the hands of careful managers, and I would advise the investment of labor and capital in the pursuit, for family and commercial purposes. Vineyards: The Concord is generally preferred; upland, rich and well drained, is the best location. Of the new varieties of grapes, the Prentiss fruited the past two years, and is giving general satisfaction. Small fruits: The blackberry is a success; currants, with some protection, have done well; gooseberries, raspberries and strawberries fairly succeed. The Snyder blackberry is giving general satisfaction. The Manchester strawberry is worthless; Big Bob is a fine-looking berry, but of poor quality; Old Ironclad and Finch are promising. Excepting the raspberry, which was injured by dry weather, the condition of all classes of small fruits on December 1st, 1884, was good. Quince trees succeed in this locality. But few have been planted, however, and they generally on rich, deep, moist soil, and the surface of the ground dressed with salt thrown broadcast. Miscellaneous: There is a general confidence in fruit culture, and the farmers generally are planting for a family supply. The disposition to plant shade and ornamental trees to adorn the home surroundings is increasing. The district school-house yards in this section are totally neglected.

## CRAWFORD COUNTY.—By G. W. MOSTELLER, GIRARD.

Fruits: All classes of orchard trees made a fair to average growth. The crop of apples, in quantity, was below the average; peaches, failed; pears, plums and cherries were an average yield. The quality of the apples was not up to the standard; pears and plums were excellent; cherries, a fair average. Excepting the pear, which suffered some from blight, the condition of all classes of trees on December 1st, 1884, was good. No diseases developed among any other classes, excepting the apple, which was affected to some extent by the leaf-blight. Insects injurious to the tree were not prevalent. A few of the woolly aphis, and leaf-rollers and borers were discovered. Injurious to fruit, only the codling moth. The planting of orchard trees in 1884 was large of apples; light of peaches and pears. Of plums, a large number of Wild Goose were set out. The Early Richmond and English Morello cherries were planted extensively. Being largely of Eastern stock, about 25 per cent. of loss occurred. In this section, autumn is the preferable time for planting. Of recently-introduced varieties have been planted: Of apples, Mann, Tetofsky, Arkansas Black, and Balbridge; peaches, Wheatland, Mammoth

Cling; pears, LeConte, Kieffer; plums, Blackman; cherry, Montmorency, Lieb, Olivet. The Kieffer and LeConte pear trees are mostly dead; none have as yet fruited, and I do not feel warranted in recommending their planting. Blight has damaged the trees of these varieties, and of all that I have planted only one has survived the attacks of this disease. Of the old and standard varieties, the Bartlett and Flemish Beauty are most liable to blight; the Duchesse de Angouleme and Seckel are exempt. In comparison of results of upland and bottom-land apple orchards in 1884, it appears that the bottom lands, where sheltered by timber belts on the south, west and north, yielded the better results. The quality of fruit produced in such locations was superior to that grown on uplands. The pursuit of apple orcharding has been profitable in this locality; peaches have not, but the fault is with the planter; plum orchards have yielded a fair return where composed of the Miner and Wild Goose varieties. The Early Richmond and English Morello cherries are profitable, and I would advise the investment of capital and labor in such pursuits. No other investment affords so sure a fortune. The causes of failures are, largely: First, using Eastern stock which is illy adapted to our soil and climate; second, many failures occur from the utter ignorance of planters in cultivation, and from neglect; third, pruning up, instead of developing a low head, has ruined many orchards. Vineyards: The Concord, Elvira and Dracut Amber, when planted on a well-drained, sloping location, have been profitable. Small fruits: Of blackberries, the Snyder is our most reliable variety; Kittatinny and Lawton are liable to mildew or rust on the leaves. Currants succeed only when planted on the north side of a wall or fence, manured, and well cultivated. Gooseberries: The Houghton and Downing succeed. Raspberries: The McCormick is the most profitable; Turner ranks next. It should be thinned out to a few canes, and manured. Strawberry: No crop is more certain, if the plants are kept in rows and cleanly cultivated, manured and mulched during winter; the best varieties are Wilson's Albany, Charles Downing, and Crescent. They succeed best in a rich, moist, but well-drained soil. Of new varieties, the Snyder blackberry is a success. The condition of small-fruit plantations on the 1st of December, 1884, was excellent of all classes. The quince is grown successfully in our county, if set on the north side of a building or fence. Garden vegetables—recommended list for extra-early crop: Lettuce, Curled Silesia; radish, Long Scarlet Short Top; asparagus; rhubarb; beans, Golden Wax; peas, Carter's First Crop; beets, Early Egyptian; cabbage, Early Wakefield. Second-early crop: Lettuce, Nelson; radish, Long Scarlet Short Top; peas, Carter's First Crop; beans, Golden Wax; beets, Early Turnip; cabbage, Early Wakefield. For a general crop: Lettuce, radishes, peas, the same as above; for a later variety of peas, add the Champion of England; beets, Long Blood Red; cabbage, Drumhead and late Flat Dutch. Miscellaneous: There is a general confidence in fruit culture, and farmers are generally planting for a family supply of apples, peaches, plums, cherries, and grapes. There is a general disposition to ornament the home surroundings with shade and ornamental trees, flowering shrubs and plants. About 10 per cent. of the district school-house yards in our county are provided with shade trees.

ELK COUNTY.—BY S. D. LEWIS, ELK FALLS.

(North half.)

Fruits: Orchard trees of all classes made a vigorous and healthy growth. The crop in quantity, considering the nature of varieties, was: Apples, 75 per cent. of an average; peaches, failure; pears, plums, and cherries, full crop. The quality, compared with preceding years, was better than an average of apple and plum, and about an average of pear and cherry. The condition of trees on December 1st, 1884, was, apple and peach, extra; pear, plum, and cherry, good. No disease developed among the trees, except a

light form of blight in the pear. Insects injurious to trees have not been prevalent. All fruits have been remarkably free from their attacks. The planting of orchard trees in 1884 was not so extensive as in preceding years. The loss, which was very light, was caused by careless planting, and the use of poor trees. Spring-time is considered preferable for planting. Of Russian fruits, the apricot has been planted in limited quantities. Kieffer and LeConte pear trees have done well, but have not yet fruited. They have developed no indications of blight. The results as to upland and bottom-land apple orchards in 1884, indicate a preference for bottom land. Some upland orchards failed almost entirely. The quality of the product of these localities was about equal. The pursuit of orcharding has been a profitable investment in the growing of apples, plums, and cherries. I would advise every man to plant for family and commercial purposes. Vineyards: The Concord is the most profitable variety, and should be planted in spring, in rows eight feet apart each way. They do equally well on the lowest and highest land, and on any slope. The main point is to secure a full exposure to the sun at all hours of the day. Shallow and thorough culture, and close trimming, is the best system of management. Small fruits: Blackberries can be grown successfully and with large profits, with proper treatment. Currants are generally a failure. Gooseberries bear a good crop almost every year. Raspberries do not succeed. There have been many failures in the attempt to grow strawberries, and some plantations have been successful. Small fruits should have a northern slope, and be partially shaded. Of strawberries, the Chas. Downing, Crescent and Captain Jack have been most successful, and should be thoroughly and constantly cultivated during the growing season, and mulched during winter. Of new varieties of blackberries, the Early Harvest and Snyder are very good. The James Vick strawberry is among the best, and the Big Bob has been quite satisfactory. The condition of small-fruit plantations on December 1st, 1884, was good of all classes. Garden vegetables—recommended list for extra-early crop: Beans, Early Mohawk and Golden Wax; beets, Egyptian, Blood Turnip; cabbage, Early Wakefield; sweet corn, Early Minnesota; cucumbers, Improved Long Green; potatoes, Vick's Extra Early; peas, Carter's First Crop; squash, Early Bush Scalloped; tomatoes, Hubbard's Curled Leaf. Second-early crop: Beans, Wax, or Butter; beets, Extra-early Bassano; cabbage, Henderson's Early Summer; sweet corn, Crosby's Early; lettuce, New Premium Cabbage; potato, Early Ohio. General crop: Beans, White Marrowfat; beets, Long Blood Red; cabbage, Marblehead Mammoth; sweet corn, Stowell's Evergreen; onion, Red Wethersfield; potato, Red Dakota; peas, Champion of England; squash, Hubbard; tomato, Acme. Miscellaneous: There is a general confidence in fruit culture among the people of this county, and farmers generally are planting for family supply. It is so universally the case, it is rarely you see a farm that is more than two years old without at least a few fruit trees set out for family use. The disposition to plant shade and ornamental trees, flowering shrubs and plants, to adorn the home surroundings, is not so general as it should be, but the example of a few in each neighborhood who are adorning their homes is bearing good fruit. My own grove of three acres has caused others in this community to begin to plant. Most of the school-house yards in this county are "out on the commons," but few of them are fenced, or have trees surrounding the house.

*(South half.—By D. C. Harkness, Howard.)*

Fruits: All classes of orchard trees made a healthy and vigorous growth in 1884. The crop in quantity, considering the nature of varieties, was of apples and cherries 75 per cent. of a full crop; peaches, 25 per cent.; pears and plums, 50 per cent. The quality, compared with preceding years, was good of all classes except the peach, which was poor. The condition of trees on December 1st, 1884, was good of all classes. Of insects, none have appeared injurious to the fruit, except the codling moth and curculio. The planting of orchard trees in 1884 was large of apples, medium of peach, and light of



pear, plum and cherry. Twenty-five per cent. of loss occurred, caused by the use of trees shipped in from out of the State, and careless handling. Of new or recently introduced varieties were planted the Arkansas Black apple, the Kieffer and LeConte pear. Of Russian fruits, a considerable number of apple trees have been planted, of which a large proportion have died. The only instance of blight occurring on my place was on a few Kieffer pear trees. But little difference has been discovered between the productiveness of bottom and upland apple orchards in 1884, but the quality of the product grown upon the bottom land was the best. Prior to 1884, the uplands have been the most profitable. The pursuit of orcharding has been profitable with all classes of fruit, excepting the plum and cherry, and I would advise the investment of labor and capital in the pursuit for family and commercial purposes. Plums could be grown profitably if means were used to prevent the attacks of the curculio. Small fruits: Blackberries grown in stools are profitable. Gooseberries and raspberries where properly cared for are profitable. I have grown the Snyder blackberry for five years, and am well pleased with the plant; fruit is quite good, but small. The condition of all classes of small-fruit plantations on December 1st, 1884, was good. Miscellaneous: There is a general confidence in fruit culture among the people of this county, and farmers generally are planting for family supply. Very little has been done in this county to provide the school-house yards with shade trees.

FORD COUNTY.—By JAMES NICOLL, SPEAREVILLE.

Fruits: Apple trees made the best growth in 1884 of seven years past. Peach trees are doing well. Very few bearing apple trees are found in this locality. Peach trees have borne a light crop. The condition of all classes of trees on December 1st, 1884, was good, no diseases having developed among them. Have not discovered any insects injurious either to tree or fruit. The planting of orchard trees in 1884 was rather light of all classes. Spring-time is preferred for such work. On river bottoms, and uplands where irrigation is practicable, it is safe to plant fruit trees. Garden vegetables have been successful where the following-named varieties have been grown: For a general crop, parsnip, Hollow Crown; carrot, Orange; cabbage, Burpee's; potato, Early Ohio; sweet potato, Bermuda and Nansemond; onion, Red Wethersfield; turnip, Strap Leaf. Very few of the school-house yards in this county have been even fenced, or contain any shade trees.

GREENWOOD COUNTY.—By A. N. GODFREY, MADISON.

Fruits: All classes of orchard trees made a vigorous and healthy growth. The crop in quantity, considering the nature of varieties, was of apples and cherries, full; plums very light, peaches failure, pears fifty per cent. of an average. The quality, compared with previous years, was better of apples, good of pears, medium of cherries, and inferior of plums. The condition of trees on December 1st, 1884, was good of all classes. No disease developed, except a light attack of curled-leaf among the peaches. Of insects injurious to fruit, the codling moth is making its appearance in fall and winter apples, and the curculio is troublesome in the plum and cherry. The planting of orchard trees in 1884 was less than usual of all classes. I should judge the loss of the planting to be about ten per cent., which was much less than usual, the season being quite favorable. Rough handling in shipment and delivery was the principal cause of loss, most of the trees being from the East. Spring-time for peach, plum, and cherry, and autumn for apple and pear, are considered the most favorable seasons for planting. Of new and recently-introduced varieties of apples, there have been planted the Arkansas Black, Eastwood Sweet, and Blackbird, which are new here; also, the Kieffer pear and Blackman plum. No blight has occurred among the Kieffer trees. Of the older varieties,

nearly all sorts were injured by this disease a few years ago; have only a few Bartlett and Flemish Beauty left. The results as to upland and bottom-land apple orchards, in 1884, were in favor of upland in both quantity and quality. The pursuit of orcharding has been profitable as regards the apple, peach, plum, and cherry. The pear has not been profitable. I would advise all persons to plant for family and commercial purposes. Vineyards: A slightly-elevated site, with gravelly soil, has proved the most desirable location for a vineyard. Vines should be planted in the spring, very early, trained to stakes for the first two years, then on smooth wire trellis. The Concord is the principal variety used. Small fruits: The blackberry is successfully grown here, and pays well as a market fruit, and for family use is indispensable. Currants do not succeed; they may be fruited with proper care and management, but do not repay the necessary expense and trouble. Gooseberries are successful; are very important for family use, but do not sell well in our markets. The raspberry also succeeds, meeting with ready sales, and we find them a paying crop. Strawberries are to be highly recommended; have met with ready sales here at very satisfactory prices. The Snyder blackberry has proven to be hardy, and fully equal to the Kittatinny. The condition of small-fruit plantations on December 1st, 1884, was very good of all classes excepting the currant. Miscellaneous: There is a general confidence in fruit-culture among the people in this county, and farmers are generally planting for family purposes. There is an increasing disposition to plant shade and ornamental trees, flowering shrubs and plants around the homes. Very few district school-house yards in this county have been provided with shade trees.

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HARPER COUNTY.—BY S. H. NESBIT, ANTHONY.

Fruits: All classes of fruit trees made a vigorous and healthy growth. There was a full crop of peaches and Sand plums, the only classes which were of sufficient age to fruit. The condition of all classes of trees on December 1st, 1884, was good and healthy. The only insect observed injurious to the tree was the tent caterpillar, in small numbers, which were destroyed by burning the nests with kerosene torches held under the limbs. The planting of orchard trees in 1884 was extensive of all classes. There has been no loss reported in spring planting, where the stock was in good condition when received, and due care was given in its handling. We prefer spring-time for the planting of fruit trees in this section. A few of the Russian varieties of apples have been planted; trees appear to grow well, and I presume the fruit will be all right, as the tree agents *would not lie*—oh no! The Kieffer and LeConte pear trees made a vigorous growth, and show no disposition to blight. The profitableness of investments in orcharding in this county cannot as yet be determined. Peach trees produced a very heavy crop of fruit the past season. I would advise our people to plant for family and commercial purposes. Vineyards: As to locations, there is not much difference in results. The Concord is the only variety successfully grown here, and should be planted in spring-time. Dig large holes, and fill half-full of loose earth in an inclined direction, from the bottom to the top. Set the plants on the slope with their roots well sprouted, and pack the dirt around them thoroughly. Cultivate the ground thoroughly for the first year by plowing, hoeing and mulching in the fall and winter with well-rotted manure. Small fruits: Blackberries I am satisfied will be profitable. The currant has not yet been tried. The Pale Red or American Seedling gooseberry has done well this year, bushes only two years from cuttings being loaded down with fruit. The native blackcap raspberry was also a remarkable success—bushes spread out on the ground with loads of fruit; were most successful on upland, sheltered by wind-breaks. Of strawberries, the Chas. Downing, Captain Jack, Crescent and Jumbo have been successfully grown. All classes of small fruits should be thoroughly cultivated. Raspberries and blackberries should have their canes pinched in during the growing season, when they have

attained a height of a foot and a half. The Snyder blackberry is a failure in this section. The Kittatinny ripens first, and lasts two weeks after the Snyder is all gone. The condition of small-fruit plantations on December 1st, 1884, was good of all classes except the currant. Garden vegetables: I am not posted in regard to varieties, etc., but from the amounts found in our markets, and from the size of everything, from a peanut to a 200-pound pumpkin, I would say all classes are doing well. Miscellaneous: Our people are becoming more confident each year of the success of fruit-culture, and it is not half so difficult to sell a man a bill of fruit trees as it was a few years ago. The farmers are generally planting for family purposes, but the county is overrun with tree agents, who sell anything, without regard to whether it is suited to this part of the State or not. There is a general disposition to adorn the home surroundings with shade trees, and flowering shrubs, and plants, and it would seem the more you ask for a tree, and the bigger lie one can tell, the larger the bill ordered. It don't make any difference whether trees grow or not—next year the settlers will buy more. The district school-house yards are generally covered with grass and weeds, bits of stone, and broken slates. Not one yard in a hundred has a tree of any kind, nor are they even fenced.

KINGMAN COUNTY.—By L. W. LEACH, KINGMAN.

Fruits: The growth of orchard trees during the season of 1884 was vigorous and healthy. The crop in quantity, considering the nature of varieties, was good of all classes excepting the pear. The quality, compared with preceding years, cannot be determined, as that was the first year of fruitage in this county. The condition of trees on December 1st, 1884, was good of all kinds, no diseases having developed among them. Of insects there were none troubling the fruit trees in this section, excepting the peach-tree borer, which were removed by the use of a knife. The planting of orchard trees in 1884 was quite extensive of all classes, and not to exceed 5 per cent. of loss occurred. Spring-time is considered the most favorable season of the year for the planting of fruit trees in this section. Of Russian fruits, some few varieties of apples were planted the past season; also a few of the Kieffer and LeConte pear, which have shown no tendency to blight. Trees seem to do well on both upland and bottom. There are none fruiting sufficiently to give any conclusion as to the difference in results between the two localities. I would advise the investment of capital and labor in the pursuit of orcharding for family and commercial purposes. Small fruits: Blackberries have been successful, and will evidently become profitable. The same may be said of gooseberries and strawberries, while currants and raspberries will not pay. The Snyder blackberry is inferior in its quality, and the plant does not endure the dry weather of this section. The condition of small-fruit plantations on December 1st, 1884, was good of the blackberry, gooseberry and strawberry; of the others poor. The quince has not yet been planted, to my knowledge, in this county. Miscellaneous: From the extensive number of trees which have been planted in this county, one would reasonably conclude that there is a general confidence in the pursuit. A few are planting shade and ornamental trees, flowering shrubs and plants, to adorn the home surroundings. I have not yet seen a district school-house yard that has been adorned with shade trees.

LABETTE COUNTY.—By E. G. WICKERSHAM, PARSONS.

(North half.)

Fruits: All classes of orchard trees made a vigorous and healthy growth in 1884. The crop in quantity, considering the nature of varieties, was of apples, pears and cherries, an average of other years, while the peach and plum were almost an entire failure. The quality, compared with preceding years, was of apple, pear and cherry much better than for several years, and the few specimens that were found upon the peach trees were

very large and fine. The condition of trees on December 1st, 1884, was good of all classes. No diseases were developed among the apple, pear and peach, but the plum and cherry were somewhat affected. Insects injurious to tree and fruit were not prevalent the past season. Autumn is considered the best time for planting in this locality. The Kieffer pear is a very promising variety; trees were heavily loaded with fruit this season. The LeConte has not yet come into bearing. Blight has not made its appearance in either of these varieties. Of the old varieties of pear trees, the Seckel is the least liable to the attacks of blight, and the Duchesse de Angouleme next. As to localities for apple orchards, I prefer the upland. The fruit grown on such locations is every way better, and maintains its quality much longer. The pursuit of orcharding has been a profitable investment in this locality. Small fruits: The blackberry, currant and strawberry have all been successful, and are profitable. The condition of small-fruit plantations on December 1st, 1884, was good of all classes. The quince tree is quite a success in this locality, and the land on which they are planted should be treated to plenty of fish brine.

*(South half.—By J. L. Williams and H. S. Coley, Onwego.)*

Fruits: All classes of orchard trees made a healthy and vigorous growth the past season. The crop of fruit in quantity, considering the nature of varieties, was about 50 per cent. of an average of apples, peaches a failure, pears full crop, plums 25 per cent., cherries 75 per cent. The condition of trees on December 1st, 1884, was good of all classes, no disease having developed except a light form of blight among the pear trees. Insects injurious to the tree or fruit were not prevalent in this section, excepting in a few cases the curculio appeared. The planting of orchard trees in 1884 was quite extensive of the apple and peach, attended with a loss of about 25 per cent. among the fall and scarcely any among the spring planting. Of the newly-introduced varieties of fruit, many of the apple, peach, and pear were planted. Of the Russian fruits, a great many of the varieties of apples were planted, but none have proven as yet to possess any desirable qualities. The Kieffer and LeConte pear trees are not of sufficient age yet to enable me to determine their value. Both varieties have shown a tendency to blight. Of the old standard varieties, the Bartlett has suffered seriously from the attacks of this disease, while the Seckel, Lawrence, and Duchesse de Angouleme are least liable to its attacks. The results of apple orchards on upland and bottom land would indicate a preference in favor of the bottom lands, where the fruit is more abundant and of a much larger character, while in some orchards on uplands the quality is much the best. The pursuit of orcharding has been profitable in all classes except the plum. It is safe to invest labor and capital in the pursuit for family and commercial purposes. Vineyards: A northern slope is the most suitable location for the grape-vine, though it will succeed to some extent in any other. Vineyards should have the same culture that is necessary to grow a good crop of corn. Small fruits: All classes succeed and are profitable in this section excepting the currant, which does poorly. Of the newly-introduced varieties of small fruits, the Early Harvest and Early Cluster blackberry are rather tender for this locality. The Snyder, while hardy, is not profitable. Fay's Prolific currant does reasonably well in shady places. James Vick and Manchester strawberry succeed only fairly well; the Big Bob is worthless. The condition of small-fruit plantations on December 1st, 1884, was good of all classes excepting the currant, which was only fair. The quince is succeeding in this county when planted upon black soil, cultivated and manured, and supplied with a limited quantity of salt scattered broadcast on the ground. Miscellaneous: There is a general confidence among our people in the pursuit of fruit-growing, and farmers generally are planting for family and market purposes. There is also a general disposition to plant shade and ornamental trees, flowering shrubs and plants, to adorn the home surroundings. Very few of the school-house yards in our county are provided with shade trees which are maintained in a healthy condition.

## MONTGOMERY COUNTY.—BY P. C. BOWEN, CHERRYVALE.

Fruits: All classes of orchard trees, where well cultivated, made a vigorous and healthy growth the past season. The crop of fruit in quantity, considering the nature of varieties, was 75 per cent. of apples, 60 per cent. of pears, 25 per cent. of plums and cherries, of an average of other years; peaches were an entire failure. The quality, compared with preceding years, was equal of apple, plum, and cherry, but was below it of the pear. The condition of trees on December 1st, 1884, was generally good of all classes. No disease developed, excepting a very light form of blight in the pear. Insects injurious to the tree were the tent caterpillar, rascally leaf-crumpler, and peach-tree borers. But little has been done to exterminate these insects. The branches containing the nests of the caterpillars are cut away and burned in some cases, and a solution of coal tar and water used by syringing for the leaf-rollers, but with indifferent success. Insects injurious to the fruit were the codling moth and curculio. The codling moth was captured by bandaging the bodies of trees with paper and rags in a few instances. The planting of orchard trees in 1884 was extensive of the apple and cherry, but was light of the peach, pear, and plum. The loss occurring did not exceed ten per cent., and resulted from bad condition of trees when received, neglect in planting and after-culture, and the attacks of insects. Spring-time is generally considered the most favorable season for planting of trees. Of new and recently-introduced varieties were planted the Stump and Arkansas Black apple, Anderson's Red and Yellow peach, a few of the Kieffer pear, and the Olivet cherry. Of the Russian fruits, only a few of the apple were planted, some of which have failed to live, and in most cases they have made only a poor and sickly growth. I do not think the Russian apples suited to our climate. Blight has not yet appeared among the pear trees in this section. The results as to upland and bottom-land apple orchards, in 1884, would not indicate any preference so far as the quantity of the product is concerned; the quality is best from the uplands. The pursuit of orcharding has been very remunerative in this section, with all classes of orchard fruits, and I would advise the investment of labor and capital in the pursuit, for family and commercial purposes. Orchardng has in many cases been a failure, for one or more of three reasons: First, carelessness or neglect on the part of the planters; second, planting on exposed locations where strong southerly winds during the growing season have caused the trees to lean to the northeast, thereby inducing sun-scald on their trunks, which invited the attacks of the flat-headed borer; third, the practice of heading trees high, thereby causing the results mentioned in cause No. 2. Vineyards: I would recommend upland, or second bottom having a southern or eastern slope, as the best location. The Concord, Dracut Amber, Norton's Virginia, Catawba and Moore's Early are the most valuable varieties, and should be planted in the fall in rows eight to twelve feet apart each way, (according to the growth of variety,) upon ground that has good drainage, or subsoiled and underdrained if inclined to be wet. Small fruits: The Kittatinny blackberry is hardy and prolific, and the best for this latitude yet tested. Currants do not succeed. The Houghton gooseberry is hardy and productive; the Downing succeeds best when partially shaded. Blackcap raspberries, such as the McCormick, Gregg, and Tyler, are a complete success; red varieties also do well, but are less productive. Strawberries are generally successful when given good cultivation through the summer, and mulching in the winter. I prefer a northern slope, with deep, sandy soil, for small fruits. The Crescent strawberry, fertilized by the Wilson's Albany, is the most valuable for market. The Tyler raspberry is recommended for an early sort, the McCormick for medium, and the Gregg for late. Strawberries should be cultivated freely after each rain. Blackberries, raspberries and gooseberries should be cultivated and hoed freely until the fruit sets. Of new varieties, the Snyder blackberry fruited the past season, but it is too small in size and poor in flavor. The Big Bob strawberry has not given satisfaction. The condition of small-fruit plantations on December 1st, 1884, was good of all

classes excepting the currant. The quince is succeeding in this county, wherever tried. It appears to do best upon limestone soil; should be cultivated well for five years, then seeded down with clover and the ground top-dressed with salt. Miscellaneous: Confidence in fruit-culture does not exist among our people generally, although many believe it will pay when rightly managed. They are, however, planting trees, but very generally neglecting small fruits. School-house yards are generally in a neglected condition.

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NEOSHO COUNTY.—By C. W. HAYDEN, THAYER.

Fruits: All classes of orchard trees made a vigorous and healthy growth the past season. The crop in quantity, considering the nature of varieties, was very light of all classes. The quality, compared with preceding years, was better of some varieties of apples; peaches, plums and cherries were damaged by insects. The condition of trees on December 1st, 1884, was good of all classes excepting the pear, the wood of which was not well ripened. Insects injurious to the tree were not more prevalent than usual; to the fruit, they were prevalent. The planting of orchard trees in 1884 was extensive of the apple and peach, and light of the other classes. The loss occurring was very small, not to exceed 5 per cent., resulting from neglect and poor preparation of the ground before planting. Spring-time is considered the most suitable season for the planting of fruit trees. Of the Russian fruits, some varieties of the apple were planted. A very few trees of the Kieffer and LeConte pear were planted. Blight has not been prevalent among the pear trees in this section. The results as to upland and bottom-land apple orchards in 1884 would give preference to the upland. Spring frosts sometimes destroy the crops upon the bottoms, without affecting those upon the uplands. The pursuit of orcharding has been profitable with the apple, plum and cherry, but doubtful as to the others. I would nevertheless advise investments in this pursuit for family and commercial purposes. Small fruits: All classes are successful excepting the currant, when planted on good, deep, well-drained land. Of the new varieties, the Snyder blackberry has proven satisfactory. The condition of small-fruit plantations on December 1st, 1884, was good of all classes excepting the currant. The quince is succeeding fairly in this county, when planted in the border of the vegetable garden and receiving the same treatment as the vegetables. Miscellaneous: There is a general confidence in fruit-culture among our people, and farmers are generally planting such as the apple, peach and plum, but not to any extent of small fruits. There is a general disposition, especially among those settling in this vicinity during the last three or four years, to adorn the home surroundings with shade and ornamental trees, flowering plants and shrubs. About 5 per cent. of the district school-house yards have shade and ornamental trees; the others are still surrounded by the original prairie sod.

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SEDGWICK COUNTY.—By WM. McCracken, SUNNY DALE.

(North half.)

Fruits: All classes of orchard trees made a healthy and vigorous growth the past season. The crop in quantity, considering the nature of varieties, was large of apple and cherry, fair of pear, and light of peach and plum. The quality, compared with preceding years, better of apple, about the same of pear and cherry, and not as good of peach and plum. The condition of trees on December 1st, 1884, was very fine. No disease had developed, except a light form of blight among the pears. Insects injurious to trees were not prevalent; injurious to fruit were the codling moth and the plum curculio, which are becoming very numerous. I do not know of any remedy that has been so effectual as allowing the hogs to range the orchard, and eat the fallen fruit. Planting in the season of 1884 was extensive of the apple, but not so general of other classes. The loss incurred was quite heavy, being about 25 per cent., caused by bad handling of

the tree agents. Spring is generally conceded to be the best season of the year for tree planting. Of the new or recently-introduced varieties, some of the Russian fruits were planted, also some of the Kieffer, LeConte and Garber pears, and a few of the Russian apricots. The older varieties of the Russian apples have been quite successful. The Kieffer pear has grown quite thrifty, but has not yet fruited. The Garber is as rapid and vigorous a grower as a cottonwood tree. The LeConte is a very healthy-growing tree. No tendency to blight has developed among these varieties, but it has been prevalent among the old standard varieties. The seedling pear is the most liable to its attacks. The Louise Bonne de Jersey and Beurre de Anjou have all blighted, and about half of the Bartlett's. The Seckel, the Sugar, and others I do not know the name of, do not blight. The results as to upland and bottom-land apple orchards in 1884, developed the fact that the bottom land produced the finest product, both in quantity and quality; but the upland is more reliable, on account of its escaping the late spring frosts. The pursuit of orcharding has been a profitable investment except in the growing of the pear, more so than any general farm pursuit, and I would advise our people to plant for family and commercial purposes. Small fruits: All classes of small fruits have been profitable, except the currant. I would recommend planting on a southeast slope. Of the newer varieties of small fruits, the Snyder blackberry is worthless here. Fay's Prolific and Lee's Prolific currant do not succeed. Of strawberries, the James Vick and Big Bob have done well; Manchester and Old Ironclad have failed. The condition of small-fruit plantations on December 1st, 1884, was never better, excepting of the currant. The quince does not succeed remarkably well in this county. It will not grow except upon wet or damp land. Miscellaneous: There is a general confidence among our people in fruit-growing, and farmers generally are planting for family use. The disposition to plant shade and ornamental trees, flowering plants and shrubs about the home is much stronger than heretofore. About one-fourth of all the school-house yards are provided with shade trees.

(*South half.—By J. G. Sampson, Derby.*)

Fruits: Orchard trees made a healthy and vigorous growth of all classes in 1884 excepting the plum and cherry, which were moderate. The crop in quantity, considering the nature of varieties, was about 50 per cent. of a full crop of the apple and plum, peach and cherry full, pear 25 per cent. The quality, compared with preceding years, was No. 1 of all classes. The condition of trees on December 1st, 1884, was sound and healthy. Insects were less numerous than usual. The planting of orchard trees in 1884 was equal to that of preceding years, and the loss incurred did not exceed 5 per cent. Spring-time is generally considered the most favorable season to plant. Of Russian fruits, a few of the apples were planted. The Kieffer and LeConte pear trees have been planted, but none as yet have fruited. They do not show more tendency to than some other varieties. The old standard varieties have not suffered seriously from blight. Bottom-land apple orchards in 1884, produced the best results. The farmers of this county have found the pursuit of orcharding a profitable investment with all classes excepting the peach, which is not successful in some localities. I would advise our people to plant for family and commercial purposes—for family by all means. Vineyards: The grape-vine succeeds on all good soil. The Concord is the leading variety, and should be planted in spring in rows eight feet apart. Small fruits: Blackberries yield a paying crop about once in three years. Currants are not successful. Gooseberries bear abundantly. Raspberries result the same as the blackberry. Strawberries are doing finely. The condition of small-fruit plantations on December 1st, 1884, was good of all classes. The quince does not succeed in this county. Miscellaneous: There is considerable confidence among our people in fruit-culture, and farmers generally are planting largely. The disposition to adorn the homes with shade and ornamental trees is not general. A great many are using evergreens for such purposes. Most of our district school-house yards are unprovided with shade trees.

SUMNER COUNTY.—By H. C. ST. CLAIR, BELLE PLAINE.

*(North half.)*

**Fruits:** The growth of orchard trees the past season was not equal to that of preceding years. The crop in quantity, considering the nature of varieties, was good of all classes, and the quality, compared with preceding years was an average. The condition of trees on December 1st, 1884, was sound and healthy. Insects injurious to fruit were not prevalent, although the codling moth was found in limited numbers. The planting of orchard trees the past year was not extensive. The loss was very small, not exceeding five per cent. Spring-time is generally considered the most favorable season of the year for planting. Of the Russian varieties of fruit, a few of the apple have been planted. The Kieffer and LeConte pear were planted in limited numbers. The results as to upland and bottom-land apple orchards in 1884 would indicate a preference for bottom land, both as to quantity and quality of product. The pursuit of orcharding has been a profitable investment of all classes, and I would advise our people to plant for family and commercial purposes. **Vineyards:** Well-drained locations, sloping to the south and west, are preferable. The Concord is the most successful variety planted in this locality. Spring-time is decidedly the best time for the planting of grape-vines, and they should have a heavy mulching during the year. **Small fruits:** All classes have been successful except the currant. For small fruits I would recommend well-drained locations having a rich soil. Of the new sorts, the Snyder blackberry has proven a success in this locality. James Vick and Manchester strawberry have each done well. The condition of small-fruit plantations on December 1st, 1884, was good of all classes except the currant. The quince does not succeed in this county, although it has been planted in rich land and given the best of treatment. All kinds of garden vegetables have been successfully cultivated in this section. **Miscellaneous:** There is a general confidence among our people in fruit culture, and farmers are generally planting for family supplies. There is also a general disposition to plant shade trees for ornamenting the home surroundings. The district school-house yards in our county have been sadly neglected.

*(South half.—By L. A. Simmons, Wellington.)*

**Fruits:** All classes of orchard trees made a vigorous and healthy growth the past season, excepting the cherry, which was ordinary. The crop in quantity, considering the nature of varieties, was of apples fair, peaches heavy, all other classes good. The quality, compared with preceding years, was, of apples, good; peaches, budded, good, seedlings inferior: the other classes were excellent. The condition of trees on December 1st 1884, was very fine. Insects injurious to tree or fruit were not prevalent. The planting of orchard trees in 1884 was very extensive of all classes except pears, which was moderate. The loss incurred did not exceed five per cent. Spring-time is generally conceded to be the most favorable season of the year for planting. Of the Russian varieties of fruit, only the old standard apple—the Alexander—has been planted, and a few apricots. With the exception of the apricot they have been a success. The Kieffer and LeConte pear trees made a fine growth, but neither is yet old enough to fruit. They show no disposition to blight. Blight has not been prevalent in this section even among the older sorts. The result as to upland and bottom-land apple orchards in 1884 shows that the largest product has been gathered from the bottom-lands. The upland orchards are doing well, and the quality of the product has generally been finer than that from the bottoms. I would prefer the bottom lands for a market orchard, but for domestic purposes I would prefer the uplands. The pursuit of orcharding has been a profitable investment in all classes excepting the pear, which are raised only for home use. I would advise our people to plant for family and commercial purposes. **Vineyards:** I can see no difference in the results from planting in different locations. The varieties preferable are the Concord for the many, earlier and later varieties for those



who will give careful attention. The spring is the best time to plant. Of the new varieties, Moore's Early is doing well. Worden may supplant the Concord. The Lindley gives general satisfaction. Small fruits: Blackberries do well with thorough cultivation, if the canes are severely pinched back. No currants have been tested but the Black Naples, and that is almost worthless, although it bears abundantly. The Houghton gooseberry grows rapidly, and bears enormously every year with little attention. Raspberries with good cultivation are profitable. Of strawberries, the Wilson's Albany, Chas. Downing and Kentucky are successful, but the Crescent is the most productive. They should be grown in matted rows. I would recommend any slope as a proper location, except a southern one, and the varieties such as recommended in the voted list of this Society. Cultivation should be thorough each year until the middle of July. Of the newer varieties of blackberry, the Snyder is commended, although it bears a rather small berry in dry seasons; would prefer the Kittatinny for my own use. The Shaffer's Colossal raspberry is a success in a small way; believe it will be profitable. The condition of small-fruit plantations on December 1st, 1884, was good of all classes except the currant. The quince is not fully a success in this county. Our soil seems too dry for it. Miscellaneous: There is a general confidence among our people in fruit-culture—which is increasing year by year—and farmers with but few exceptions are planting to supply their families with fruit. There is a general disposition to plant shade and ornamental trees, flowering shrubs and plants, around the homes. The condition of our district school-house yards is very bad. About ten out of 160 districts have shade trees.

WILSON COUNTY.—By G. B. BROWN, GUILFORD.

Fruits: All classes of orchard trees made a vigorous and healthy growth in 1884. The crop of fruit was quite equal to that of the preceding year, with the exception of peaches, which failed. The condition of trees on December 1st, 1884, was good of all classes. Insects injurious to tree were prevalent—borers, rascal leaf-crumpler, and fall web worm; to fruit, codling moth, which is increasing rapidly. Apple and peach trees were extensively planted. Cherry, an average of other years; pear and plum, lightly. The loss was not over ten per cent., and was due to careless handling. Autumn is generally considered the most favorable season for planting. Russian varieties of apples have been planted; trees make a good growth, but have not fruited yet. Kieffer pear trees made a good growth; appear to be hardy; have not yet fruited. LeConte trees leave out too early to succeed in this climate. Of the older varieties of pears, the Seckel, Early Harvest, Louise Bonne de Jersey, Duchesse de Angouleme and Lawrence are the least subject to blight; while the Bartlett, Howell and Glout Morceau are quite liable to the attacks of this disease. As to the results of upland and bottom-land apple orchards, in 1884, the latter-named location yielded the heaviest crop, and prior to 1884 was the most profitable. But this, in part, was due to the fact that most of the older orchards were planted on lowlands. Of all the classes of orchard fruits, the apple and cherry have been profitably grown. For family purposes, I recommend the general list, but for commercial, only the apple and quince. Vineyards: Locations having a southern aspect, rich soil, and well drained, are suitable. They should be deeply plowed, and, if practicable, subsoil well stirred. Plant in fall, and each year give shallow cultivation until the fruit is nearly grown. The Concord and Delaware are preferable; of the new varieties, Moore's Early, Brighton and Lady are valuable additions to our established list. Small fruits: All classes can be profitably grown. Blackberry and raspberry must be confined to rows; currant, partially shaded; gooseberry, renewed every fifth year. These, including the strawberry, should be given clean and frequent cultivation. The condition of small-fruit plantations on December 1st, 1884, was good of all classes. Quince trees are thriving, and producing good crops of fruit at proper age. Miscellaneous: There is a general

confidence in fruit-culture among our people, and farmers generally are planting for family purposes. On the older farms, ornamental and shade trees and flowering shrubs and plants are quite common, and the disposition in this direction is each year rapidly developing. Our school-house yards are neglected as to shade trees.

WOODSON COUNTY.—BY W. W. SMITH, NEOSHO FALLS.

Fruits: All classes of orchard trees made a vigorous and healthy growth. The crop in quantity was good of all classes excepting peach, which was a failure. Quality was fine of apple and pear, medium of plum, poor of cherry. The condition of trees on December 1st, 1884, was good of all classes. Insects injurious to tree or fruit were not prevalent. The planting of orchard trees was extensive the past year, and the per cent. of loss very small. Most of fruit trees are planted in the spring, that being generally considered the most favorable time. Russian apple trees were used in some localities, but the results are not encouraging for a continuance of these sorts. Of pears, the Kieffer and LeConte are under trial; have not yet fruited. All varieties are affected with blight. Bottom lands are preferred for apple orchards, as the crops are larger, and the quality 30 per cent. better than when grown on uplands. Apple orcharding has been a profitable investment in this county, and I would recommend the pursuit of fruit-growing for family, and apple orcharding, composed of earlier varieties, for commercial purposes. Other classes than apples are not profitable. Vineyards: Almost any location is suited to grapes. I would plant in spring, train to trellis, cultivate well while young, and mulch thereafter. The Concord is the one above all others desirable; Dracut Amber is quite a favorite. Small fruits, (by O. P. Haughawout, Neosho Falls:) Blackberry, for the past two years, has produced only half a crop. Currant has produced a full crop during the past two years; with proper care and location seems promising for the future. Gooseberry has always been successful. Raspberry and strawberry have been successful during the past two years. Of the new varieties, the Snyder blackberry is too small a berry, and the plant is not more hardy than Kittatinny. Souhegan raspberry is promising; not a strong grower. Shaffer's Colossal, strong grower, and prolific, but am not pleased with its fruit. Of strawberries, James Vick is the only sort I have found which equals the Crescent in growth, and shall use it with that variety as a fertilizing plant. Small fruits should be planted in clean, open lands, away from shade and roots of trees. Prefer a northern slope, but character of soil is most important. Of strawberry, have tried a large number of varieties, and find none equal to the Crescent, fertilized by the Cumberland Triumph. Their cultivation should be clean and constant until October 1st, each year, but none in spring before fruiting. The Manchester is a promising sort; sunburns slightly. Finch, a good firm berry, but not sufficiently productive. Hart's Minnesota is far better. The condition of small-fruit plantations on December 1st, 1884, was good of all classes. Quince succeeds in this county on rich, moist soil, with good, not deep, culture. There is a general confidence among the people of this county in fruit culture, and farmers are planting for family use, and adorning their home surroundings with shade and ornamental trees and flowering shrubs. About one per cent. of the school-house yards are provided with shade trees; the rest are in a shabby condition.

## VOTED FRUIT LIST FOR KANSAS, 1884.

ARRANGED BY DISTRICTS AND COUNTIES.

## NORTHERN FRUIT DISTRICT.

FAMILY ORCHARD.—Varieties receiving the largest vote, arranged in the order of preference.

		SUMMER APPLES.																										Total vote.
		Atchison	Brown	Clay	Cloud	Davis (north half)	Davis (south half)	Dickinson	Doniphan	Jackson (north half)	Jackson (south half)	Jefferson (north half)	Jefferson (south half)	Leavenworth	Lincoln	Marshall	Mitchell	Nemaha	Pottawatomie (north half)	Pottawatomie (south half)	Riley—T. C. Wells, Manhattan	Riley—J. W. Blain, Manhattan	Rock	Saline	Shawnee (north of Kas. river)	Shawnee (south of Kas. river)	Washington	Wyandotte
1	Early Harvest	2	2	2	2	1	1	2	1	1	1	3	2	1	3	3	2	1	1	1	1	1	1	1	1	1	1	26
2	Carolina Red June	3	1	1	1			1		3	3	2	2	2	4	4											2	22
3	Red Astrachan	4		3	5	6		3	2	2	2	1	1	5	2	3	3	4	4	4	4	2	2	3	3	3	1	19
4	Cooper's Early White				4		3				5						1									4	4	10
5	Duchess of Oldenburg	1	5									4		5					3				5		2	3	2	8
Scattering votes:																												
6	Hightop Sweet		3		3	8	5										4				3							
7	Early Pennock						4					3				4					5		4					
8	Amer. Summer Pearmain								5	4	4				4	5					5							
9	Sops of Wine					9	2							4													5	
10	Summer Queen		6															4										
11	Benoni											5												5				
12	Trenton Early					5																				3		
13	Early Joe					3																						
14	Primate								3											2								
15	Golden Sweet					7					4																	
16	Yellow June																									2		
17	Fourth of July																										1	
18	Sweet Bellflower														3													
19	Large Yellow Bough												4															
20	Summer Rose																											
21	Keswick Codlin																					4						
22	Tetofsky															1												

## AUTUMN APPLES.

1	Maiden's Blush.....	1	1	1	1	1	1	1	1	1	1	1	1	No report.	1	4	1	2	2	1	1	1	1	1	1	3	25
2	Rambo.....	2	3	2	2	3	4	2	3	3	5			6	5	3	3	1	2	1	3	5	2	2	3	2	23
3	Lowell.....				3	2	2	2				2		2	5	3					2	2	3	3			13
4	Fameuse.....		2			5			3		2			2		4		3	4		4	4	5	4			11
5	Grimes's Golden.....	4						5						2	6					3		3			2		4
Scattering votes:																											
6	Jonathan.....									2	4				2		5	1									5
7	Fall Wine.....					8			5									4			5						
8	Wine.....			3											5	5											3
9	Bailey's Sweet.....					6															6					1	
10	Fall Pippin.....		5																	3							
11	Cooper's Early White.....						3							1													
12	Dominie.....								4		4																
13	Keswick Codlin.....																				4			4			
14	Westfield Seek-no-further.....																								4	4	
15	Talman's Sweet.....																										
16	Mother.....													8													1
17	Chenango Strawberry.....						9	5																			
18	Gabriel.....		4																								
19	Fulton.....					4																					
20	Broadwell.....					7																					
21	Granar's Pearmain.....						3																				
22	Porter.....						4																				
23	Ortley.....												2														
24	Sops of Wine.....																										3
25	Jersey Sweet.....													3													
26	Jeffers.....														3												
27	Autumn Swaar.....														4												1
28	Fall Winesap.....														7												
29	Fallwater.....														9												
30	Duchess of Oldenburg.....					4															2						
31	Belmont.....								4																		
32	Autumn Strawberry.....	3																			1						

NORTHERN FRUIT DISTRICT—CONTINUED.

FAMILY ORCHARD.—Varieties receiving the largest vote, arranged in the order of preference.

		WINTER APPLES.																												Total votes.	
		Atchison.	Brown.	Clay.	Cloud.	Davis (north half).	Davis (south half).	Douglas.	Dickinson.	Jackson (north half).	Jackson (south half).	Jefferson (north half).	Jefferson (south half).	Leavenworth.	Lewell.	Lincoln.	Marshall.	Mitchell.	Nemaha.	Pottawatomie (north half).	Pottawatomie (south half).	Riley—T. C. Wells, Manhattan.	Riley—J. W. Plaid, Manhattan.	Rooks.	Saline.	Shawnee (north of Kaa. river).	Shawnee (south of Kaa. river).	Washington.	Wyandotte.		
1	Winesap.....	1	1	2	2	2	5	1	1	1	2	2	2	No report.	3	3	1	2	1	1	4	7	1	1	4	4	5	2	27		
2	Ben Davis.....	2	3	3	5	1	2	5	2	3	4	4	7	8	1	2	5	5	2	2	3	7	5	3	1	3	5	1	1	22	
3	Rawie's Genet.....	4	4	1	6	4	5	2	5	4	6	8	8	4	4	4	4	4	4	4	4	4	4	3	3	1	6	2	5	25	
4	Jonathan.....	2	5	7	7	7	4	3	5	5	5	5	6	1	1	3	3	3	3	3	3	3	3	2	2	2	3	2	17	17	
5	Missouri Pippin.....	3	3	1	10	2	3	6	3	3	2	5	5	6	6	6	6	6	6	6	6	6	6	5	7	2	2	2	17	17	
6	Willow Twig.....	4	4	4	4	8	8	6	3	2	2	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	6	13	
7	White Winter Pearmain.								4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4	11	11
8	Rome Beauty.....				13									10	7	5	7	5	5	5	5	5	5	5	5	5	5	5	1	10	10
9	Smith's Cider.....					3				6		3																7	7	5	5
10	Gilpin.....	9						8	5																7		9	8	4	7	7
Scattering votes:																															
11	Domine.....					7						5						6					1			5					
12	Grimes's Golden.....					1	6									2						6									
13	Talman's Sweet.....		8					7				10				8								6							
14	Yellow Bellflower.....		7					8								7															
15	Peck's Pleasant.....															6															
16	Roman Stem.....					3										9															
17	Lawver.....				4			9								5															
18	Fink.....				9	9																									
19	Ribston Pippin.....																					1									
20	Ladies' Sweet.....																					2									
21	Limber Twig.....																												3		
22	Minkler.....												3																		
23	Fameuse.....																												4		
24	Bentley's Sweet.....																					5									
25	Stark.....		6																												
26	Golden Russet.....																												6		
27	Lansingburg.....																6														
28	Broadwell (sweet).....																						6								
29	Rhode Island Greening.....												9																		
30	Huntaman's Favorite.....									10																					
31	Ortley.....																														
32	Newtown Pippin.....					11																									
33	Wagener.....					12																									
34	York Imperial.....																													3	
35	Winter Sweet Paradise.....					14																									
36	Pound Sweet.....																				8										

Market orchard.

		SUMMER APPLES.																		Total votes.
		Early Harvest.	Carolina Red June.	Cooper's Early White.	Red Astrachan.	Duchess of Oldenburg.	Not reported.	1	1	3	1	1	1	3	1	1	1	1	1	1
1	Early Harvest.....	1	2	1	1	1	1	1	1	3	1	1	1	3	1	1	1	1	1	1
2	Carolina Red June.....	3	1	1	3	1	2	2	2	4	1	3	1	2	2	4	2	2	2	11
3	Cooper's Early White.....		3	2	3	2	4	1	3	5										9
4	Red Astrachan.....				3	4	2	5												7
5	Duchess of Oldenburg.....	2	4		4															
Scattering votes:																				
6	Sop of Wine.....				2	2		3							2					
7	Early Pennock.....							6		4									3	
8	Hightop Sweet.....							3												
9	Primate.....							4												
10	Benoni.....													4					5	
11	Orange Pippin.....																			
12	Early Strawberry.....															3				
13	William's Favorite.....									3										
14	Summer Queen.....														4					
15	Keswick Codlin.....																	1		

## NORTHERN FRUIT DISTRICT—CONTINUED.

MARKET ORCHARD.—Varieties receiving the largest vote, arranged in the order of preference.

		AUTUMN APPLES.																										Total votes.
		Wyandotte	Washington	Shawnee (south of Kansas river)	Shawnee (north of Kansas river)	Selling	Rooks	Riley—J. W. Blain, Manhattan	Riley—T. C. Wells, Manhattan	Pottawatomie (south half)	Pottawatomie (north half)	Nemaha	Mitchell	Lincoln	Leavenworth	Jewell	Jefferson (south half)	Jefferson (north half)	Jackson (south half)	Jackson (north half)	Doniphan	Dickinson	Davis (south half)	Davis (north half)	Cloud	Clay	Brown	Ashmun
1	Maiden's Blush															No report.	1	1	1	1	1	1	1	1	2	1	3	1
2	Rambo																1	1	2	3	3	2	3	2	1	2	2	2
3	Lowell																1	1	3	4	3	2	2	1	4	1	2	2
4	Fameuse																1	1	3	4	2	2	2	4	1	1	1	2
5	Jonathan																1	1	2	1	2	1	1	1	1	1	1	3
Scattering votes:																												
6	Grimes's Golden																											
7	Fall Wine																											
8	Ortley																											
9	Fulton																											
10	Fall Pippin																											
11	Autumn Strawberry																											
12	Chenango Strawberry																											
13	Duchess of Oldenburg																											
14	Cooper's Early White																											
15	Ladies' Sweet																											
16	Bailey's Sweet																											
17	Dominie																											
18	Gabriel																											
19	Gramar's Pearmain																											
20	Westfield Seek-no-further																											

## WINTER APPLES.

1	Winesap.....	1	2	2	1	1	1	2	1	1	2	5			3	1	3	1	3	4	4	5	3	3	4	1	3	3	1	22
2	Ben Davis.....	3	1	3	2	7	2	2	1	2	2	3	1	1	1	2	2	2	1	6	6	1	6	2	4	1	2	1	1	25
3	Missouri Pippin.....	2	4	1	5	3	3	4	3	4	3	4	4	2	2	4	4	3	6	6	6	6	3	3	3	4	6	2	20	
4	Rawle's Genet.....		3		3	3		4	3	5	6	5		2	2	4	4	3	6	6	6	6	6	6	3	5	5	2	18	
5	Jonathan.....				2	1		5				1	2																13	
6	Willow Twig.....	4			4		5	3						7	7														11	
7	White Winter Pearmain.....							6	10	4				8	5	5													8	
8	Rome Beauty.....				10			4						8	5	5													5	
9	Dominie.....													8	5	6													3	
10	Grimes's Golden.....				6				7																				3	
Scattering votes :																														
11	Gilpin.....							6							9															
12	Yellow Bellflower.....		5																											
13	Talman's Sweet.....		6																											
14	Lawver.....				8									4																
15	Smith's Cider.....				13			6																						
16	Ribston Pippin.....																													
17	Peck's Pleasant.....																													
18	Minkler.....												3																	
19	Huntsman's Favorite.....													5																
20	Wagener.....				9																									
21	Red Canada.....																													
22	Vandevere Pippin.....								9																					
23	Fink.....																													
24	Ortley.....																													
25	Stark.....																													
26	Fallawater.....																													

**Varieties, arranged in the  
order of preference.**

Varieties, arranged in the order of preference.		Total votes.									
	Wyandotte.....	11	11	8	5	...	...	...	...	...	...
	Washington.....	1	1	4	5	...	...	...	...	...	...
	Shawnee (south of Kansas river).....	Not reported.	Not reported.	...	...	...	...	...	...	...	...
	Shawnee (north of Kansas river).....	Not reported.	Not reported.	...	...	...	...	...	...	...	...
	Saline.....	1	1	2	3	...	...	...	...	...	...
	Books.....	Not reported.	Not reported.	...	...	...	...	...	...	...	...
	Riley—J. W. Blain, Manhattan.....	Not reported.	Not reported.	...	...	...	...	...	...	...	...
	Riley—T. C. Wells, Manhattan.....	Not reported.	Not reported.	...	...	...	...	...	...	...	...
	Pottawatomie (south half).....	Not reported.	Not reported.	...	...	...	...	...	...	...	...
	Pottawatomie (north half).....	1	1	2	3	...	...	...	...	...	...
	Nemaha.....	1	1	2	3	...	...	...	...	...	...
	Mitchell.....	Not reported.	Not reported.	...	...	...	...	...	...	...	...
	Marshall.....	Not reported.	Not reported.	...	...	...	...	...	...	...	...
	Lincoln.....	3	3	4	5	...	...	...	...	...	...
	Leavenworth.....	1	1	2	3	...	...	...	...	...	...
	Ipswich.....	Not reported.	Not reported.	...	...	...	...	...	...	...	...
	Jefferson (south half).....	Not reported.	Not reported.	...	...	...	...	...	...	...	...
	Jefferson (north half).....	Not reported.	Not reported.	...	...	...	...	...	...	...	...
	Jackson (south half).....	Not reported.	Not reported.	...	...	...	...	...	...	...	...
	Jackson (north half).....	3	3	4	5	...	...	...	...	...	...
	Doniphan.....	Not reported.	Not reported.	...	...	...	...	...	...	...	...
	Dickinson.....	1	1	2	3	...	...	...	...	...	...
	Davis (south half).....	1	1	2	3	...	...	...	...	...	...
	Davis (north half).....	1	1	2	3	...	...	...	...	...	...
	Cloud.....	Not reported.	Not reported.	...	...	...	...	...	...	...	...
	Clay.....	Not reported.	Not reported.	...	...	...	...	...	...	...	...
	Brown.....	2	3	4	5	...	...	...	...	...	...
	Atchison.....	1	1	2	3	...	...	...	...	...	...
<i>Early.</i>											
1	Amsden's June.....	2	3	4	5	...	...	...	...	...	...
2	Alexander.....	1	1	2	3	...	...	...	...	...	...
3	Hale's Early.....	3	2	4	5	...	...	...	...	...	...
4	Early Beatrice.....	3	2	4	5	...	...	...	...	...	...
5	Early Rivers.....	4	5	6	7	...	...	...	...	...	...
6	Wyandotte Chief.....	4	5	6	7	...	...	...	...	...	...
7	Crawford's Early.....	4	5	6	7	...	...	...	...	...	...
8	Gov. Garland.....	4	5	6	7	...	...	...	...	...	...
9	Early Louise.....	4	5	6	7	...	...	...	...	...	...
10	Troth's Early Red.....	4	5	6	7	...	...	...	...	...	...
11	Early Kansas.....	4	5	6	7	...	...	...	...	...	...
12	Arkansas Traveler.....	4	5	6	7	...	...	...	...	...	...
13	Large Early York.....	4	5	6	7	...	...	...	...	...	...
14	Mountain Rose.....	4	5	6	7	...	...	...	...	...	...
15	Early York.....	5	6	7	8	...	...	...	...	...	...
<i>Medium.</i>											
1	Stump the World.....	3	4	5	6	...	...	...	...	...	...
2	Old Mixon Free.....	4	5	6	7	...	...	...	...	...	...
3	George the Fourth.....	4	5	6	7	...	...	...	...	...	...
4	Crawford's Early.....	4	5	6	7	...	...	...	...	...	...
5	Large Early York.....	4	5	6	7	...	...	...	...	...	...
6	Crawford's Late.....	4	5	6	7	...	...	...	...	...	...
7	Foster.....	1	1	2	3	...	...	...	...	...	...
8	Early York.....	5	6	7	8	...	...	...	...	...	...
9	Mountain Rose.....	2	3	4	5	...	...	...	...	...	...
10	Old Mixon Cling.....	5	6	7	8	...	...	...	...	...	...
11	Early Rivers.....	1	1	2	3	...	...	...	...	...	...
12	Yellow St. John.....	2	3	4	5	...	...	...	...	...	...
13	Reeves's Favorite.....	3	4	5	6	...	...	...	...	...	...
14	Red Rareripe.....	3	4	5	6	...	...	...	...	...	...
15	Harvest Moon.....	4	5	6	7	...	...	...	...	...	...
16	Barnard.....	4	5	6	7	...	...	...	...	...	...
17	Yellow Rareripe.....	4	5	6	7	...	...	...	...	...	...
18	Amelia.....	4	5	6	7	...	...	...	...	...	...
19	Chinese Cling.....	4	5	6	7	...	...	...	...	...	...
20	Coolidge's Favorite.....	1	1	2	3	...	...	...	...	...	...
21	Heath Cling.....	2	3	4	5	...	...	...	...	...	...
<i>Late.</i>											
1	Heath Cling.....	4	1	1	1	2	2	3	4	1	11
2	Crawford's Late.....	1	1	1	1	1	1	1	1	1	6
3	Smock.....	2	2	2	2	3	3	3	3	3	6
4	Ward's Late Free.....	1	1	2	2	1	1	1	1	1	4
5	Steady.....	3	3	3	3	3	3	3	3	3	4
6	Stump the World.....	3	3	3	3	3	3	3	3	3	4
7	Shipley's Late Red.....	5	5	5	5	5	5	5	5	5	4
8	Salway.....	2	2	2	2	2	2	2	2	2	4
9	La Grange.....	2	2	2	2	2	2	2	2	2	4
10	Old Mixon Free.....	4	4	4	4	4	4	4	4	4	4
11	Crockett's Late White.....	4	4	4	4	4	4	4	4	4	4
12	Old Mixon Cling.....	4	4	4	4	4	4	4	4	4	4
13	Mrs. Brett Wilkins's Cling.....	1	1	1	1	1	1	1	1	1	4

## NORTHERN FRUIT DISTRICT—CONTINUED.

PEARS.

Varieties, arranged in the order of preference.

		Wyanadito	Washington	Shawnee (south of Kaa. river)	Shawnee (north of Kaa. river)	Saline	Riley—J. W. Blain, Manhattan	Riley—T. C. Wells, Manhattan	Pottawatomie (south half)	Pottawatomie (north half)	Nemaha	Michol	Marshall	Lincoln	Leavenworth	Jewell	Jefferson (south half)	Jefferson (north half)	Jackson (south half)	Jackson (north half)	Ellsworth	Doniphan	Dickinson	Davis (south half)	Davis (north half)	Cloud	Clay	Brown	Atchison
<i>Early.</i>																													
1	Bartlett	...	...	...	...	...	1	...	...	...	1	1	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...
2	Osband's Summer	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...
3	Clapp's Favorite	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	2	2	...	...	...	...
4	Flemish Beauty	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	Early Catherine	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	Doyenne d'Ete	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	Bloodgood	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	Manning's Elizabeth	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Medium.</i>																													
1	Bartlett	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	1	...	...	...	...	...
2	Seckel	...	...	...	...	...	...	...	...	...	...	...	...	5	4	...	...	...	...	...	...	...	...	4	3	1	...	...	...
3	Flemish Beauty	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	1	2	2	...	...	...
4	Duchesse d'Angouleme	...	...	...	...	...	...	...	...	...	...	...	...	4	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	Louise Bonne de Jersey	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	Howell	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	Belle Lucrative	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	Sheldon	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	White Doyenne	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	Swan's Orange	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
11	Beurre d'Anjou	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
<i>Late.</i>																													
1	Vicar of Winkfield	...	...	...	...	...	...	...	...	...	...	...	...	2	4	...	...	...	...	...	...	...	...	2	3	...	...	...	...
2	Lawrence	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	1	...	...	...	...
3	Winter Nellis	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...
4	Duchesse d'Angouleme	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	Sheldon	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	Seckel	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	Beurre Easter	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	Howell	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	Beurre d'Anjou	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

PLUMS.

1	Wild Goose	1	...	1	...	2	2	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	Miner	2	...	...	...	1	3	1	...	...	...	...	...	2	3	2	...	...	...	...	...	...	...	...	...	...	...	...	2
3	Emigrant	...	...	...	...	...	1	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	Damson	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	Weaver	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...
6	Lombard	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...
7	Cultivated Native	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	Yellow Egg	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...

## PLUMS.

1	Wild Goose	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
2	Miner	2	...	...	...	...	...	...	...	...	...	...	...	1	2	...	...	...	...	...	...	...	...	...	...	...	...	...
3	Emigrant	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...
4	Damson	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	Weaver	...	...	...	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...
6	Lombard	3	...	...	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...
7	Cultivated Native	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
8	Yellow Egg	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...

## CHERRIES.

		<i>Early.</i>																			
1	Early Richmond	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	May Duke	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
		<i>Late.</i>																			
1	English Morello	1	...	...	...	1	1	...	...	1	1	...	...	1	1	1	...	...	...	...	...
2	Common Morello	...	...	...	1	...	2	...	...	2	...	...	...	2	1	...	...	...	...	...	...
3	Late Richmond	...	...	...	...	...	...	...	...	...	...	...	...	5	...	...	...	...	...	...	...
4	Ostheim	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	Montmorency	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...
6	Olivet	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...
7	Belle Magnifique	...	...	...	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...

NORTHERN FRUIT DISTRICT—CONTINUED.

GRAPES.

Varieties, arranged in the order of preference.

		Wyandotte	Washington	Shawnee (south of Kas. river)	Shawnee (north of Kas. river)	Saline	Kiley—J. W. Blain, Manhattan	Kiley—T. C. Wells, Manhattan	Pottawatomie (south half)	Pottawatomie (north half)	Nemaha	Marshall	Lincoln	Leavenworth	Jewell	Jefferson (south half)	Jefferson (north half)	Jackson (south half)	Jackson (north half)	Ellsworth	Doniphan	Davis (south half)	Davis (north half)	Clond	Clay	Brown	Atchison
<b>Early.</b>																											
1	Concord	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	Ives																										
3	Champion																										
4	Worden																										
5	Moore's Early																										
6	Hartford Prolific																										
7	Delaware																										
8	Dracut Amber																										
9	Pocklington																										
10	Massasoit																										
11	Brighton																										
12	Black Eagle																										
<b>Medium.</b>																											
1	Concord																										
2	Delaware																										
3	Dracut Amber																										
4	Elvira																										
5	Martha																										
6	Lady																										
7	Reisling No. 1																										
8	Martha Seedling																										
9	Noah																										
10	Amber																										
11	Louisiana																										
12	Reisling No. 2																										
13	Ives																										
<b>Late.</b>																											
1	Catawba																										
2	Goethe																										
3	Concord																										
4	Delaware																										
5	Clinton																										
6	Cynthiana																										
7	Isabella																										
8	Pearl																										
9	Neosho																										
10	Hermann																										

BLACKBERRIES.

<b>Early.</b>																											
1	Kittatinny																										
2	Wilson's Early																										
3	Early Harvest																										
<b>Late.</b>																											
1	Snyder	1	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	Kittatinny																										
3	Lawton																										

RASPBERRIES.

<b>Early.</b>																											
1	Doolittle	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	Turner (red)																										
3	Cultivated natives																										
4	Davison's Thornless																										
5	Souhegan																										



## NORTHERN FRUIT DISTRICT—CONCLUDED.

## RASPBERRIES—Concluded.

		Wyandotte	Washington	Shawnee (a. Kas. river)	Shawnee (n. Kas. river)	Saline	Hooker	Riley—J. W. Blain	Riley—T. C. Wells	Pottawatomie (a. half)	Pottawatomie (n. half)	Nemaha	Marshall	Lincoln	Leavenworth	Jewell	Jefferson (south half)	Jefferson (north half)	Jackson (south half)	Jackson (north half)	Ellsworth	Dickinson	Davis (south half)	Davis (north half)	Clay	Brown	Atchison

## CURRANTS.

1	Large Red Dutch	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	White Dutch																									
3	Cherry																									
4	White Grape																									

## GOOSEBERRIES.

1	Houghton	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
2	Downing																									
3	Mountain																									
4	Pale Red																									
5	Smith's Improved																									

## STRAWBERRIES.

<i>Early.</i>																										
1	Wilson's Albany	1																								
2	Charles Downing																									
3	Crescent																									
4	Crystal City																									
5	Captain Jack																									
6	Miner's Great Prolific																									
7	Colonel Cheney																									
<i>Medium.</i>																										
1	Charles Downing	1																								
2	Crescent																									
3	Cumberland Triumph																									
4	Captain Jack																									
5	Sharpless																									
6	Mt. Vernon																									
7	Miner's Great Prolific																									
8	Austin																									
9	Monarch of the West																									
10	Wilson																									
<i>Late.</i>																										
1	Kentucky	1																								
2	Sharpless																									
3	Colonel Cheney																									
4	Glendale																									
5	Charles Downing																									
6	Champion																									
7	Colfax																									
8	Manchester																									
9	Jersey Queen																									
10	Longfellow																									

## CENTRAL FRUIT DISTRICT.

## SUMMER APPLES.

FAMILY ORCHARD.—Varieties receiving the largest vote, arranged in the order of preference.

		Anderson	Barton	Chase	Cody	Douglas	Franklin	Harvey	Johnson	Linn	Lyon	McPherson	Marion	Miner	Morris	Osage (northern)	Osage (central)	Osage (southern)	Pawnee	Reano (northern)	Reano (southern)	Rice (northern)	Rice (southern)	Wabunsee	Total votes
1	Early Harvest	1	1	1	1	1	1	1	2	2	1	1	2	2	1	1	1	3	No report	1	4	3	3	1	20
2	Carolina Red June	2	...	3	2	2	2	2	3	1	...	2	1	1	2	...	...	...	...	1	1	1	2	2	19
3	Red Astrachan	...	2	4	3	4	...	...	4	7	2	4	4	3	3	...	...	...	...	2	2	...	...	...	13
4	Cooper's Early White	...	...	2	4	3	3	4	1	...	...	3	...	...	...	...	...	...	...	...	2	1	...	...	10
5	Hightop Sweet	3	...	...	...	7	...	...	...	5	3	...	...	4	...	3	3	1	...	5	...	...	...	...	9
<i>Scattering votes:</i>																									
6	Early Pennock	...	...	...	...	...	...	3	...	3	...	...	...	...	...	...	...	4	...	5	3	...	...	...	...
7	American Summer Pearmain	...	...	...	5	5	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...
8	Summer Queen	...	...	...	...	...	...	...	...	2	...	...	3	...	...	...	...	...	...	4	...	...	...	...	...
9	Chenango Strawberry	...	...	...	...	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	...	...
10	Lowell	...	...	...	...	...	...	...	...	4	...	...	...	7	...	...	...	...	...	...	...	...	...	...	...
11	Rambo	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...
12	Early Redstreak	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	Benoni	...	...	...	...	...	...	...	...	...	...	6	...	...	...	...	...	...	...	...	...	...	...	...	...
14	Early Joe	...	...	...	...	...	...	...	...	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	Duchess of Oldenburg	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

## AUTUMN APPLES.

1	Maiden's Blush.....	1	1	1	1	1	2	1	2	1	2	1	1	No report	1	1	1	3	19	
2	Rambo.....	2	5	2	4	2	1	3	6	2	3	1	3	3	3	2	2	3	5	16
3	Fameuse.....		4	5		5	4	2	3	1	4		3						10	7
4	Lowell.....	3		3	2	3	3				3			2					7	6
5	Fall Wine.....		3				6		7	3		4		4						7
Scattering votes:																				
6	Jonathan.....					10							5	3		4			2	
7	Grimes's Golden.....			4	11								4				3		1	
8	Autumn Swaar.....		2											2	1					
9	Benoni.....																	2		
10	Roman Stem.....				3								2		1					
11	Wine.....					5			2						2					
12	Millam.....						4		4											
13	Fall Pippin.....									4										
14	Seek-no-further.....										1		6						6	
15	Red Winter Pearmain.....				9											2				
16	Celestia.....												1							
17	Brown's Late Queen.....												3							
18	Cooper's Early White.....																		4	
19	Mother.....												2							
20	Duchess of Oldenburg.....						5													
21	Holland Pippin.....							5												
22	Fulton.....								5											
23	Yellow Bellflower.....												7							
24	Ortley.....				6															
25	Rome Beauty.....				7															
26	Hubbardston Nonsuch.....				8															
27	Porter.....									8										
28	Autumn Strawberry.....									9										

## CENTRAL FRUIT DISTRICT—CONTINUED.

FAMILY ORCHARD.—Varieties receiving the largest vote, arranged in the order of preference.

		WINTER APPLES.																							Total votes
		Anderson	Barlow	Chase	Coffey	Douglas	Franklin	Harvey	Johnson	Linn	Lyon	McPherson	Merion	Miami	Morrill	Orange (central)	Orange (southern)	Pawnee	Rebo (southern)	Rebo (northern)	Rice (southern)	Rice (northern)	Wabasha		
1	Winesap	1				2	1	1	1	1	5	2	2	1	1	4	2	No report	2	1	3	1	21		
2	Ben Davis		1	1		1		8	2	2	11	1	3	2	2	1	2	2	3	2	1	1	17		
3	Rawle's Genet		2	5	3	3		3	5		3		3	8		1	6	4	4	4	2	15			
4	Missouri Pippin		5	5	3			4			9	1	3	3		3	7	7	1	2	5	6	15		
5	Willow Twig		3	8		4		6		10	4	5	4			9	5	5	3	3	6	5	14		
6	Jonathan		2	4	2		2	5		2		4				7	1		3	3	2	11			
7	Rome Beauty		4	8	5		7				5			9		5			7	5			9		
8	Smith's Cider			7	4	5				3					2		3						6		
9	Gilpin			9	6	7										8							3		
10	White Winter Pearmain									8						4	8						5		
Scattering votes:																									
11	Domine							7	4								10		8						
12	Grimes's Golden		6							1									7						
13	Red Winter Pearmain		4				4																		
14	Roman Stem					6				7															
15	Talman's Sweet		7			6																			
16	Huntsman's Favorite					2																			
17	York Imperial								3																
18	Hubbardston Nonsuch							3																	
19	Pryor's Red									4															
20	Winter Sweet Paradise					5																			
21	Wine		6																						
22	Rambo										6														
23	Peck's Pleasant																								
24	American Golden Russet					8																			
25	Swaar									8															
26	Baldwin		7																						
27	Bailey's Sweet									9															
28	Limber Twig									12															
29	Bentley's Sweet													4											
30	Moofe's Sweet													5											
31	Michael Henry Pippin													6											
32	Newtown Spitzenberg															3									
33	Wagener									6															
34	May	3												7											

## Market Orchard.

Market Orchard.		SUMMER APPLES.																			
1	Early Harvest.....	1	2	1	1	1	1	2	2	2	1	1	4	No report.	2	1	14				
2	Carolina Red June.....	3				2	2		3		1	2	2		1		10				
3	Red Astrachan.....	2	4	2	3		3		1		3	3	1		2	1	11				
4	Cooper's Early White.....	1		2	3	4	1		1				1		3		8				
5	Chenango Strawberry.....				4												2				
Scattering votes:																					
6	Early Pennock.....							4					2								
7	Duchess of Oldenburg.....	3																			
8	Fameuse.....											3									
9	Hightop Sweet.....											4									
10	Summer Rose.....															4					
11	American Summer Pearmain.....					5															

## CENTRAL FRUIT DISTRICT—CONTINUED.

		AUTUMN APPLES.																								
		Anderson.	Barton.	Chase.	Coffey.	Douglas.	Franklin.	Harvey.	Johnson.	Linn.	Lyon.	Marion.	McPherson.	Miami.	Morris.	Osage (northern).	Osage (central).	Osage (southern).	Rawmoe.	Rebo (north half).	Rebo (south half).	Rice (north half).	Rice (south half).	Wabamsee.	Total vote.	
1	Maiden's Blush.....	1	1	1	1	1	1	1	1	1	5	...	...	...	1	1	1	5	...	...	...	...	1	3	...	15
2	Rambo.....	...	...	3	...	3	2	...	...	...	...	...	...	...	...	...	2	3	...	...	...	...	...	4	...	9
3	Jonathan.....	...	...	...	...	3	...	...	...	...	...	...	...	...	3	2	...	...	...	...	...	...	...	...	2	4
4	Lowell.....	...	...	...	...	2	3	...	...	...	2	...	...	...	...	...	...	2	...	...	...	...	...	...	...	4
5	Fall Wine.....	...	...	4	...	...	...	...	...	...	4	...	...	...	...	...	...	4	...	3	...	...	...	...	...	4
Scattering votes:																										
6	Benoni.....	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	
7	Autumn Swaar.....	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	
8	Wine.....	...	...	...	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	...	
9	Grimes's Golden.....	...	...	...	...	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	
10	Rome Beauty.....	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	
11	Fall Winesap.....	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
12	Holland Pippin.....	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
13	Dominie.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	
14	Ortley.....	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	3	...	...	...	...	...	...	...	...	
15	Porter.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
16	Fameuse.....	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
17	Duchess of Oldenburg.....	...	...	...	...	...	...	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
18	Cooper's Early White.....	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	

## WINTER APPLES.

1	Ben Davis.....	2	1	1	1	2	6	1	2	1	1	2	2	1	2	1	3	3	2	3	1	1	2	19	
2	Missouri Pippin.....	1	5	3	3	4	2	3	1	1	6	7	3	2	1	3	4	4	1	2	2	1	5	4	17
3	Winesap.....	...	...	2	2	1	1	3	1	1	6	7	4	3	1	2	2	2	4	1	3	3	1	1	15
4	Rawle's Genet.....	...	...	2	5	5	7	4	5	7	7	7	6	6	5	5	8	5	3	4	1	2	5	5	14
5	Willow Twig.....	...	...	3	4	4	...	...	5	2	2	2	5	5	...	5	8	...	...	...	...	...	...	...	...
6	Jonathan.....	3	...	8	...	...	2	6	...	2	9	9	1	...	1	5	4	1	...	...	5	...	4	3	9
7	Gilpin.....	...	...	...	...	6	...	...	...	...	5	5	...	...	...	7	9	...	5	...	6	...	3	7	...
8	White Winter Pearmain.....	...	...	...	...	...	...	7	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	3	...
9	Red Winter Pearmain.....	...	4	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2
10	Smith's Cider.....	...	...	...	...	6	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	2
Scattering votes:																									
11	Newton Pippin.....	...	...	...	...	...	...	...	...	...	...	...	...	3	...	7	...	...	...	...	...	...	...	...	...
12	Rome Beauty.....	...	...	...	...	...	8	...	...	...	...	...	...	...	...	6	...	...	...	...	...	...	...	...	...
13	Baldwin.....	...	...	7	...	...	...	...	...	...	...	...	...	...	...	...	10	...	...	...	...	...	...	...	...
14	Hubbardston Nonsuch.....	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	Huntsman's Favorite.....	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	Dominie.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	...	...	...
17	Fulton.....	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	York Imperial.....	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	Swaar.....	...	...	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
20	Roman Stem.....	...	...	7	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	Winter Sweet Paradise.....	...	...	...	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	Virginia Greening.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	6
23	Ladies Sweet.....	...	...	...	...	...	...	...	...	8	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	Wine.....	...	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

**CENTRAL FRUIT DISTRICT—CONTINUED.**

		PEACHES.																				
Varieties, arranged in the order of preference.		Anderson	Horton	Chase	Conger	Franklin	Harvey	Linn	Lyon	Marion	McPenson	Mindel	Morris	Osgood (n.b.)	Osgood (cent'n)	Osgood (south n.)	Pawnee	Reno (n. half)	Reno (s. half)	Richo (n. half)	Richo (s. half)	Waltham
EARLY.																						
1	Amsden's June.....	2	...	2	1	3	2	1	1	...	3	1	...	1	2	4	1	12	3	2	...	1
2	Alexander.....	1	...	1	3	4	2	...	...	...	4	2	1	...	2	...	...	1	10	8	2	...
3	Hale's Early.....	...	...	...	...	...	...	5	...	...	...	1	2	1	...	...	...	...	...	...	...	...
4	Crawford's Early.....	8	...	...	...	1	...	4	...	...	2	...	...	...	1	...	...	...	...	...	...	...
5	Early York.....	5	...	3	...	...	...	...	...	...	...	...	...	3	...	...	...	4	...	...	...	...
Scattering votes:																						
6	Early Beatrice.....	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...	...	...	...
7	Early Louise.....	...	...	...	5	...	...	3	...	...	...	...	...	...	...	...	1	...	...	...	...	...
8	Large Early York.....	...	...	...	...	4	...	5	...	...	...	...	...	4	...	...	...	...	...	...	...	...
9	Yellow Rarapine.....	...	...	...	...	...	...	...	...	...	5	3	...	...	...	...	...	...	...	...	...	...
10	Troth's Early Red.....	...	...	...	...	5	...	3	...	...	...	...	...	...	...	...	...	4	...	...	...	...
11	Ashby's Early.....	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
12	Early Rivers.....	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	Red Rarapine.....	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...
MEDIUM.																						
1	Old Mixon Free.....	1	...	2	5	2	...	4	...	...	2	...	...	1	...	...	...	2	...	1	2	...
2	Stump the World.....	2	...	1	2	1	...	5	...	...	1	...	2	...	...	...	...	1	...	...	...	...
3	George the Fourth.....	...	...	3	...	...	...	2	...	...	...	...	...	...	...	...	...	2	...	1	...	...
4	Crawford's Early.....	...	...	...	...	...	...	1	...	...	5	2	...	...	...	...	1	3	...	...	...	...
5	Yellow Rarapine.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	3	4	...
Scattering votes:																						
6	Smock.....	...	...	...	7	3	...	1	...	...	4	...	...	...	...	...	...	...	...	...	...	...
7	Large Early York.....	...	...	...	1	...	...	3	...	...	3	...	...	...	...	...	...	...	...	...	...	...
8	Old Oxicon Cling.....	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	1	...	3	...	...
9	President.....	...	...	...	6	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
10	Anella.....	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	...
11	Rarapines.....	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...
12	Grosse Mignonne.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...
13	Yellow Alberge.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...
14	Morris White.....	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...
15	Steally.....	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	Coolidge's Favorite.....	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	Thurber.....	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...
18	Foster.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
19	Crawford's Late.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3
20	Red-cheek Melocoton.....	...	...	...	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...
21	Troth's Early Red.....	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	Susquehanna.....	...	...	...	...	...	...	...	...	...	...	...	...	5	...	...	...	...	...	...	...	...
23	Early Newington Free.....	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...
24	Jacques Rarapine.....	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...	...	...	...
25	Lemon Cling.....	...	...	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...
LATE.																						
1	Heath Cling.....	2	...	1	2	1	2	3	...	2	...	1	1	...	2	...	1	1	...	2	1	...
2	Crawford's Late.....	1	...	2	...	...	3	...	...	1	...	...	...	...	...	1	...	...	...	...	...	...
3	Ward's Late Free.....	...	...	...	1	4	...	...	...	...	1	...	...	...	...	...	...	2	...	...	4	2
4	Smock.....	...	...	3	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...
5	Indian Blood Clingstone.....	...	...	...	...	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
Scattering votes:																						
6	Late Admirable.....	...	...	...	...	...	...	1	...	5	...	...	...	...	...	...	...	...	...	...	1	...
7	Heath Free.....	...	...	...	...	...	...	2	...	4	...	...	...	...	...	...	...	...	...	...	...	...
8	Snow.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
9	Old Oxicon Cling.....	...	...	...	...	...	...	1	...	...	...	...	...	...	...	...	...	4	...	...	...	...
10	Stump the World.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	1	...	...	...	...
11	Salway.....	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...	...	...	...
12	Jacques Rarapine.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	Miami Garden Free.....	...	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	2	...	...	...	...
14	Old Mixon Free.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	3	...	...	...	...
15	Late Yellow Alberge.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...
16	Steady.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	Nanticoke.....	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	Garden Cling.....	...	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	...	...
19	Lemon Cling.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	5	...	...
20	Shipley's Late Red.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
21	Prater's October.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
22	Boogie's Mammoth.....	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...

## CENTRAL FRUIT DISTRICT—CONTINUED.

Varieties, arranged in the order of preference.		PEARS.																							
		Anderson	Barton	Chase	Coffey	Douglas	Franklin	Harvey	Johnson	Linn	Lyon	Marion	McPherson	Miami	Morris	Ossage (northern)	Ossage (central)	Ossage (southern)	Pawnee	Reno (north half)	Reno (south half)	Rice (north half)	Rice (south half)	Wabausee	
EARLY.																									
1	Doyenne d'Ete.....					1						1	1											3	
2	Bartlett.....					1											1							1	
3	Osband's Summer.....					5						2					2								
4	Madeleine.....					2											2								
5	Rostelzer.....					3																		2	
Scattering votes:																									
6	Early Harvest.....	1				4																			
7	Flemish Beauty.....					2																			
8	Howell.....					3																			
9	Bloodgood.....															4									
10	Clapp's Favorite.....																							4	
11	Dearborn's Seedling.....															5									
MEDIUM.																									
1	Bartlett.....	2		1		1							1	1	1		1							1	
2	Duchesse d'Angouleme.....	3										3					1								
3	Sheldon.....											5					2								
4	Beurre d'Anjou.....					1																		2	
5	Flemish Beauty.....	1				4																			
Scattering votes:																									
6	Clapp's Favorite.....					4						2													
7	Louise Bonne de Jersey.....					5						4													
8	Belle Lucrative.....																							1	
9	White Doyenne.....					2																			
10	Lawrence.....					2																			
11	Beurre Diel.....																3								
12	Howell.....					3																			
13	Kieffer.....														2										
LATE.																									
1	Vicar of Winkfield.....	1				4	2						1			1								7	
2	Winter Nells.....												2	2			3								
3	Seckel.....					3	1																	7	
4	Lawrence.....																2								
5	Sheldon.....					1																			
Scattering votes:																									
6	Beurre Clairgeau.....													1										6	
7	Beurre Diel.....																							1	
8	Duchesse d'Angouleme.....																							2	
9	Beurre d'Anjou.....					2																		3	
10	Flemish Beauty.....																							8	
11	Louise Bonne de Jersey.....																							4	
12	Glout Morceau.....															4									
13	Beurre d'Aremberg.....															5									
PLUMS.																									
1	Wild Goose.....	1		2	1	1	2					1	1	1	1				2		1		1	1	
2	Miner.....			2	2	3						2									2		2	2	
3	Sand.....			1	3								2										3		
4	Lombard.....				3	6															3		4	3	
5	Damson.....					4									2	3									
Scattering votes:																									
6	Cultivated natives.....											3	2												
7	Rodgers's Seedling.....						1																		
8	Washington.....																3								
9	Emigrant.....					5																			
10	Bluemont.....					6																			
11	Chickasaw.....					4	5																		
12	German Prune.....										2														

## CENTRAL FRUIT DISTRICT—CONTINUED.

Varieties, arranged in the order of preference.		CHERRIES.													
		Anderson	Barton	Chase	Coffey	Douglas	Franklin	Harvey	Johnson	Linn	Lyons	Marion	McPherson	Manly	Morris
<i>Early.</i>															
1	Early Richmond	1				1	1	1	1		1	1	1	1	1
2	May Duke							2						2	
3	Gov. Wood							3							
<i>Late.</i>															
1	English Morello	1				1	1	1	2				2	1	
2	Common Morello							2				1	2		
3	Late Duke								1					1	
4	Leib												1		
5	Gov. Wood														1
6	Late Richmond							3							

## GRAPES.

<i>Early.</i>															
1	Hartford Prolific					2		1		1		1		1	2
2	Moore's Early					3				1					3
3	Ives					2						2			
4	Concord					1									1
5	Champion											2			3
6	Worden									1					
7	Dracut Amber					1									
8	Delaware											2			
<i>Medium.</i>															
1	Concord	1	1			1		1		1	1	1	1	1	1
2	Delaware					2	2					2			
3	Dracut Amber					1							2		
4	Agawam														1
5	Martha					3								3	
6	Ives														
7	Lady							3							
8	Norton's Virginia							4							
<i>Late.</i>															
1	Catawba					2	2			1	2		1		1
2	Clinton					3	1			1		2		1	
3	Concord					1									
4	Ives												1		
5	Isabella														1
6	Union Village												2		

## BLACKBERRIES.

<i>Early.</i>															
1	Kittatinny	1	1	1	1	1				2	1		1	1	1
2	Wilson's Early							1		2				1	
3	Lawton					2				2					
4	Brunton's Early									1					
5	Early Harvest														1
<i>Late.</i>															
1	Lawton					1	1		2		1		2		2
2	Snyder					1	2	1				1	1		
3	Kittatinny								1			2		1	1

## RASPBERRIES.

<i>Early.</i>															
1	Doolittle	1				1	1	1			2	1	1		2
2	Davison's Thornless							3						1	1
3	Souhegan							2				1			
4	Tyler										1				
5	Turner (red)							2							
6	Philadelphia							3							

## CENTRAL FRUIT DISTRICT—CONCLUDED.

Varieties, arranged in the order of preference.		RASPBERRIES—Concluded.																						
		Anderson	Horton	Chase	Coffey	Douglas	Franklin	Harvey	Johnson	Linn	Lyons	Marion	McPherson	Miami	Morris	Osage (central)	Osage (southern)	Pardee	Reno (north half)	Reno (south half)	Rice (north half)	Rice (south half)	Wabamsee	
<i>Medium.</i>																								
1	McCormick	1			1				1		2	1	1		1								1	
2	Miami			1		2	1		2			2												
3	Gregg			2			2				1													
4	Smith					1																		
5	Turner (red)					3																		
6	Cuthbert (red)					4	3																	
7	Thwack (red)								3															
8	Reliance (red)					5																		
<i>Late.</i>																								
1	Gregg	1			1	2																	1	
2	McCormick					1	1																	
3	Cuthbert (red)	2								1												1		
4	Brandywine (red)									2														

## CURRANTS.

1	Large Red Dutch	1			1	1	1						1				1						1
2	White Grape					3	3						2					1					
3	Cherry					2			1									2					
4	White Dutch													1									
5	La Versailles								2														
6	Victoria																						
7	Black Naples																		3		1		
8	Native Black																				1		

## GOOSEBERRIES.

1	Houghton	1		1	1	2	1		1		1	1	1			1	1		1	1	1	1	1
2	Downing				2	3	3																
3	Mountain								2														3
4	Smith's Improved																						2
5	Pale Red					1	2																

## STRAWBERRIES.

<i>Early.</i>																							
1	Crescent*	2	1			1			2		1	2	1									2	
2	Wilson's Albany	1					1		1					2				1					
3	Chas. Downing						2		3				1								1		
4	Downer's Prolific														1								2
5	Col. Cheney						3						3										
6	Jenny Lind*																						1
7	Longworth's Prolific													2									
8	Crystal City*								4														
<i>Medium.</i>																							
1	Capt. Jack	2	1			3	3				1		1										
2	Chas. Downing	1	2			2					2		2					2					
3	Sharpless						1		1					1									
4	Cumberland Triumph					4																	
5	Wilson's Albany					1												1					
6	Hovey's Seedling*					1																	1
7	Crescent*																						
8	Green Prolific*					2		2															
<i>Late.</i>																							
1	Kentucky	1	1			3	1				2		2										
2	Glendale					2			2		1		1									1	
3	Cumberland Triumph						2		1														
4	Miner's Great Prolific					1																	
5	Sharpless					4																	

\*Pistillate varieties.



## SOUTHERN FRUIT DISTRICT.

FAMILY ORCHARD.—Varieties receiving the largest vote, arranged in the order of preference.

		SUMMER APPLES.																		
		Allen (north half)	Beaumont	Builer	Cherokee	Crawford	Cowley	Elk (south half)	Elk (north half)	Greenwood	Labette	Montgomery	Neosho (north half)	Neosho (south half)	Sedgwick	Summer	Wilson	Woodson	Total votes	
1	Early Harvest	8	1	...	1	1	3	1	1	1	2	1	2	2	4	2	1	1	18	
2	Carolina Red June	3	2	1	3	2	2	2	2	3	...	3	2	1	1	...	1	2	3	17
3	Red Astrachan	9	3	2	2	3	3	1	...	3	2	2	1	4	...	3	3	...	14	
4	Cooper's Early White	2	...	4	...	4	4	4	...	5	5	...	...	...	1	4	5	...	10	
5	Summer Queen	...	...	...	4	6	5	...	...	...	...	6	...	...	...	...	...	...	4	
<i>Scattering votes:</i>																				
6	Duchess of Oldenburg	...	...	...	...	...	...	...	...	4	...	...	3	...	...	5	...	...	...	
7	Benoni	...	3	...	7	...	...	3	...	...	...	...	...	...	...	...	...	...	...	
8	Hightop Sweet	...	...	7	...	...	...	...	...	...	...	...	...	...	...	...	4	2	...	
9	American Summer Pearmain	...	...	...	...	...	...	...	...	3	...	...	...	...	...	...	3	...	...	
10	Yellow June	...	...	...	5	...	...	...	...	...	...	3	...	...	...	...	...	...	...	
11	Golden Sweet	...	5	...	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
12	Trenton Early	...	...	...	6	...	...	...	...	...	...	5	...	...	...	...	...	...	...	
13	Lowell	...	7	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
14	Summer Rose	1	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
15	Kirkbridge White	...	...	...	...	...	...	...	...	...	...	...	...	...	2	...	...	...	...	
16	Primate	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
17	Keswick Codlin	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	4	...	
18	Early Pennock	...	...	...	...	...	...	...	...	...	4	...	...	...	...	...	...	...	...	
19	Jeffers	5	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	
20	Hawley	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	

## AUTUMN APPLES.

1	Maiden's Blush.....	1	1	1	1	1	1	1	1	1	1	1	1	2	3	1	1	2	19
2	Rambo.....	5	3	3	2	1	2	3	2	3	2	3	2	1	2	1	2	4	14
3	Lowell.....	...	2	...	3	...	3	3	2	4	...	4	3	...	3	1	...	5	12
4	Fameuse.....	...	4	...	...	...	5	3	4	...	4	3	4	...	...	...	3	...	8
5	Fall Wine.....	2	...	...	...	...	5	...	...	...	...	5	...	...	3	...	5	...	6
<i>Scattering votes:</i>																			
6	Jonathan.....	...	2	...	3	...	...	...	...	...	...	...	...	...	2	...	2	...	...
7	Grimes's Golden.....	...	5	...	2	...	...	...	...	...	...	...	...	...	...	...	1	...	...
8	Autumn Strawberry.....	...	...	...	...	...	...	...	...	2	...	3	...	...	...	...	...	...	...
9	Chenango Strawberry.....	...	...	...	...	...	...	...	...	...	...	4	...	...	...	...	3	...	...
10	Rome Beauty.....	...	6	...	...	...	...	...	...	8	...	...	...	...	...	...	...	...	...
11	Bailey's Sweet.....	...	...	...	...	...	...	...	...	...	2	...	...	...	...	...	...	...	...
12	Ortley.....	3	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
13	Wine.....	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
14	Fallwater.....	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
15	Fall Winesap.....	...	...	...	4	...	...	...	...	...	...	...	...	...	...	...	...	...	...
16	Talman's Sweet.....	...	...	...	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...
17	Fall Pippin.....	6	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...	...
18	Porter.....	...	...	...	...	...	...	...	...	5	...	...	...	...	...	...	...	...	...

**FAMILY ORCHARD.**—Varieties receiving the largest vote, arranged in the order of preference.

[illegible]

### SUMMER APPLES.

1	Carolina Red June.....		3	1	No report.	1	1	1	1	1	8
2	Early Harvest.....		1	1		2		2		1	7
3	Red Astrachan.....		2	1		3		2		2	6
4	Cooper's Early White.....		1						1	4	3
5	Trenton Early.....		3			6		4			2
<i>Scattering roles:</i>											
6	American Summer Pearmain.....							3			
7	Duchess of Oldenburg.....							4			
8	Yellow June.....				5			3			
9	Kirkbridge White.....								3		
10	Cole's Quince.....								3		
11	Hightop Sweet.....									3	
12	Summer Queen.....				4						

1	Maiden's Blush.....	1	1	1	1	5	1	1	1	9
2	Rambo.....	3	1	2	6	2	3	2	6	5
3	Lowell.....	2	No report.	3	4	3	2	5	5	
4	Grimes's Golden.....		2	3	3		6	4	3	
5	Fameuse.....	5		1			4	3		
	<i>Scattering votes:</i>									
6	Autumn Strawberry.....			2	2	1				
7	Jonathan.....		3			1				
8	Fall Wine.....	4					5	3		
9	Wine.....	3								
10	Rome Beauty.....	2								
11	Ortley.....	4								
12	Summer Queen.....			3						

## SOUTHERN FRUIT DISTRICT—CONTINUED.

		WINTER APPLES.															
MARKET ORCHARD.—Varieties receiving the largest vote, arranged in the order of preference.		Allen (north half)	Bourbon	Butler	Cherokee	Crawford	Covey	Elk	Greenwood	Labelle	Montgomery	Neesho	Sadgwick	Summer	Wilson	Woodson	Total votes.
1	Ben Davis	2	1	1	2	1	1	4	1	5	1	2	1	1	1	1	15
2	Missouri Pippin	1	3	3	2	3	2	3	2	4	3	1	2	1	2	1	14
3	Winesap	3	2	2	1	1	1	2	1	3	2	3	1	3	1	1	11
4	Willow Twig	6	4	5	3	2	2	5	6	6	6	4	4	4	2	3	9
5	Rawle's Genet	5	5	9	5	3	3	3	3	7	7	7	5	5	3	7	7
6	Jonathan	4	4	4	4	4	4	5	5	1	1	4	4	4	3	5	5
7	White Winter Pearmain	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
8	Rome Beauty	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
9	Stark	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
10	Gilpin	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
Scattering votes:																	
11	Grimes's Golden	2	2	2	2	2	2	4	2	2	2	2	2	2	2	2	2
12	Lawver	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
13	Smith's Cider	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
14	King of Tompkins County	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
15	Domitile	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
16	Ladies' Sweet	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2

## PEACHES.

		EARLY.														
1	Amesden's June.....	1	1	2	1	1	1	3	1	2	2	1	1	1	1	11
2	Alexander.....	2	1	2	2	2	2	1	1	2	3	2	1	3	1	11
3	Hale's Early.....	5	2	3	3	3	3	4	1	3	3	1	5	3	1	10
4	Early Rivers.....	4	2	3	2	2	2	2	2	2	2	2	2	2	2	3
5	Early Louise.....	3	2	2	2	2	2	2	2	2	2	2	2	2	2	3
Scattering votes:																
6	Early York.....	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2
7	Crawford's Early.....	4	2	2	2	2	2	5	2	2	2	2	2	2	2	2
8	Troth's Early.....	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
9	Briggs's May.....	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
10	Large Early York.....	2	2	2	2	2	2	3	2	2	2	2	2	2	2	2
11	Ashby's Early.....	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12	Harper's.....	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
13	Brice's Early.....	3	2	2	2	2	2	2	2	2	2	2	2	2	2	2
14	Baker's Early.....	4	2	2	2	2	2	2	2	2	2	2	2	2	2	2
15	Early Beatrice.....	2	2	2	2	2	2	4	2	2	2	2	2	2	2	2
16	Mountain Rose.....	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
17	Governor Garland.....	2	2	2	2	2	2	5	2	2	2	2	2	2	2	2
		MEDIUM.														
1	Old Mixon Free.....	1	1	2	2	2	4	1	1	5	5	2	2	2	2	9
2	Stump the World.....	1	1	2	4	1	2	2	1	1	3	3	3	3	3	6
3	Foster.....	1	1	5	5	5	5	2	1	1	1	1	1	1	1	5
4	Large Early York.....	3	1	1	1	1	1	2	2	4	1	1	1	1	1	5
5	Crawford's Early.....	3	3	3	3	3	3	3	3	3	3	3	3	3	3	1
Scattering votes:																
6	Crawford's Late.....	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
7	Yellow Alberge.....	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
8	Smock.....	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
9	Chinese Cling.....	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
10	Hale's Early.....	2	2	2	2	2	2	1	1	1	1	1	1	1	1	1
11	Coolidge's Favorite.....	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
12	George the Fourth.....	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
13	President.....	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
14	Druid Hill.....	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
15	Barnard.....	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
16	Morris White.....	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
17	Richmond.....	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
18	Old Mixon Cling.....	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
19	Snow.....	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2
20	Yellow Rareripe.....	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3
21	Mountain Rose.....	4	4	4	4	4	4	4	4	4	4	4	4	4	4	4
22	Early York.....	5	5	5	5	5	5	5	5	5	5	5	5	5	5	5

## SOUTHERN FRUIT DISTRICT—CONTINUED.

		PEACHES— <i>Concluded.</i>																		Total votes
		Allen (north half)	Allen (south half)	Bourbon	Butler	Chautauque	Cherokee	Cowley	Crawford	Elk	Greenwood	Labette	Montgomery	Nesho	Sedgwick	Sumner	Wilson	Woodson		
Varieties receiving the largest vote, arranged in the order of preference.																				
LATE.																				
1	Heath Cling	1	1	3				1			1	6		2	1	5		3	10	
2	Crawford's Late		2	1							5	1						1	6	
3	Smock			2								5			2	1		2	5	
4	Steadly	2					1	3			3		3	3		3		5	5	
5	Ward's Late Free										4							4	4	
Scattering votes:																				
6	Stump the World											3	2	1						
7	Salway							2								4				
8	Old Mixon Free											2	1			2				
9	La Grange							5										6		
10	Select seedlings				1															
11	Indian Blood Clingstone											2								
12	Brandywine	3																		
13	Shipley's Late Red	4																		
14	Heath Free							4												
15	Old Mixon Cling											4								
16	October Beauty												4							
17	Late Admirable													4						
18	Crother's	5																		
PEARS.																				
EARLY.																				
1	Bartlett				1			1							1					
2	Doyenne d'Ete	1	1																	
3	Madeleine	2										1								
4	Early Harvest													1						
5	Osband's Summer												2							
6	Duchesse d'Angouleme			2																
7	LeConte					1														
MEDIUM.																				
1	Bartlett	4	1				1				2	1		1					1	
2	Flemish Beauty	2		1				1			1	3								
3	Louise Bonne de Jersey	3	2	3	1															
4	Duchesse d'Angouleme		3		2			3			3									
5	Clapp's Favorite	5		2			2				2									
6	Seckel	1					7	2								2				
7	Howell															1				
8	Sheldon															3				
9	Belle Lucrative											4								
10	Osband's Summer							3												
11	Brockworth							4												
12	Park							5												
13	Tyson							6												
LATE.																				
1	Vicar of Winkfield	2	1	1				4	1											
2	Lawrence	1						5											1	
3	Beurre d'Anjou																			
4	Sheldon							2												
5	Onondaga			2											1					
6	Glout Morceau			3																
7	Duchesse d'Angouleme							1												
8	Mount Vernon							2												
9	Winter Nella							3												

## SOUTHERN FRUIT DISTRICT—CONTINUED.

Varieties receiving the largest vote, arranged in the order of preference.		PLUMS.													
		Allen (north half)	Bourbon	Huller	Chautauqua	Cherokee	Cowley	Crawford	Elk	Greenwood	Labelle	Montgomery	Neesho	Sedgwick	Sumner
1	Wild Goose	1	1	1	...	1	1	1	1	2	1	2	1	1	1
2	Miner	2	...	...	...	2	2	...	...	3	2	...	...	...	2
3	Chickasaw	...	...	...	...	...	...	...	...	1	1	...	...	...	...
4	Weaver	...	...	1	...	3	...	...	...	...	2	...	...	...	...
5	Lombard	...	...	...	...	2	...	...	...	...	...	...	...	...	...
6	German Prune	...	...	...	...	...	...	...	...	...	...	3	...	...	...
7	Cultivated native	...	...	...	...	...	...	...	...	...	...	...	...	...	3
8	Damson	...	...	...	...	5	...	...	...	...	...	...	...	...	...
9	Washington	...	...	...	...	4	...	...	...	...	...	...	...	...	...
CHERRIES.															
<i>Early.</i>		Allen (north half)	Bourbon	Huller	Chautauqua	Cherokee	Cowley	Crawford	Elk	Greenwood	Labelle	Montgomery	Neesho	Sedgwick	Sumner
1	Early Richmond	1	1	1	1	...	1	1	1	1	1	1	1	1	1
2	May Duke	...	...	...	...	5	...	...	...	2	2	...	...	2	...
3	Belle Magnifique	...	...	...	...	...	...	...	...	2	3	...	...	...	...
4	Black Tartarian	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	Coe's Transparent	...	...	...	...	3	...	...	...	...	...	...	...	...	...
6	Gov. Wood	...	...	...	...	4	...	...	...	...	...	...	...	...	...
<i>Late.</i>		Allen (north half)	Bourbon	Huller	Chautauqua	Cherokee	Cowley	Crawford	Elk	Greenwood	Labelle	Montgomery	Neesho	Sedgwick	Sumner
1	English Morello	2	1	1	...	1	1	1	...	2	2	1	1	2	...
2	Common Morello	...	2	...	1	...	...	...	...	1	1	...	...	1	...
3	Montmorency	1	...	...	...	...	...	...	...	...	...	...	...	...	...
4	Plumstone Morello	...	...	...	...	...	...	...	...	...	...	2	...	...	1
GRAPES.															
<i>Early.</i>		Allen (north half)	Bourbon	Huller	Chautauqua	Cherokee	Cowley	Crawford	Elk	Greenwood	Labelle	Montgomery	Neesho	Sedgwick	Sumner
1	Dracut Amber	...	1	...	1	1	1	...	...	...	1	...	...	...	1
2	Hartford Prolific	...	...	...	...	2	...	...	...	...	1	...	1	...	...
3	Moore's Early	...	...	...	...	...	...	...	...	...	...	...	2	...	3
4	Concord	...	...	...	...	...	...	...	...	...	...	...	...	...	...
5	Champion	...	...	...	...	...	...	...	...	...	...	...	...	...	2
<i>Medium.</i>		Allen (north half)	Bourbon	Huller	Chautauqua	Cherokee	Cowley	Crawford	Elk	Greenwood	Labelle	Montgomery	Neesho	Sedgwick	Sumner
1	Concord	1	1	1	1	...	1	1	1	1	...	1	1	...	1
2	Delaware	...	...	...	...	...	...	...	...	...	...	1	...	...	3
3	Dracut Amber	...	...	...	...	...	...	...	...	...	1	...	...	...	...
4	Martha	...	...	...	...	...	...	...	...	...	...	...	2	...	...
5	Lindley	...	...	...	...	...	...	...	...	...	...	...	...	...	2
<i>Late.</i>		Allen (north half)	Bourbon	Huller	Chautauqua	Cherokee	Cowley	Crawford	Elk	Greenwood	Labelle	Montgomery	Neesho	Sedgwick	Sumner
1	Clinton	1	...	1	...	...	...	...	...	...	...	...	...	...	3
2	Norton's Virginia	...	2	...	...	...	...	...	...	...	...	...	1	...	...
3	Catawba	...	...	...	...	...	...	...	...	...	...	...	3	...	2
4	Ives	...	...	1	...	...	...	...	...	...	...	...	...	...	...
5	Goethe	...	...	...	...	...	...	...	...	...	...	...	...	...	1
6	Concord	...	...	...	...	...	...	...	...	1	...	...	...	...	...
7	Isabella	...	...	...	...	...	...	...	...	...	2	...	...	...	...
BLACKBERRIES.															
<i>Early.</i>		Allen (north half)	Bourbon	Huller	Chautauqua	Cherokee	Cowley	Crawford	Elk	Greenwood	Labelle	Montgomery	Neesho	Sedgwick	Sumner
1	Kittatinny	1	1	...	...	...	1	1	...	1	1	1	2	...	1
2	Wilson's Early	...	1	...	...	...	...	...	...	...	...	...	1	1	...
<i>Late.</i>		Allen (north half)	Bourbon	Huller	Chautauqua	Cherokee	Cowley	Crawford	Elk	Greenwood	Labelle	Montgomery	Neesho	Sedgwick	Sumner
1	Lawton	...	...	...	...	...	...	...	...	1	1	1	1	...	1
2	Snyder	1	...	...	...	...	1	...	1	...	...	...	2	...	...
3	Kittatinny	...	1	...	1	...	...	...	...	...	...	...	1	...	...

## SOUTHERN FRUIT DISTRICT—CONCLUDED.

Varieties, arranged in the order of preference.		RASPBERRIES.																
		Allen (north half).....	Bouhon.....	Butler.....	Chautauque.....	Cherokee.....	Cowley.....	Crawford.....	Elk.....	Greenwood.....	Labette.....	Montgomery.....	Neesho.....	Sedgwick.....	Summer.....	Wilson.....	Woodson.....	
<i>Early.</i>																		
1	Doolittle.....			1	1		1				1						1	
2	Turner (red).....	1				1											2	
3	Davison's Thornless.....															1		
<i>Medium.</i>																		
1	McCormick.....						2	1			1				1		1	
2	Turner (red).....		1												2			
3	Miami.....			1									1					
4	Gregg.....						1	2										
5	Philadelphia (red).....																	
6	Seneca.....																2	
7	Reliance (red).....																3	
8	Cuthbert (red).....																4	
<i>Late.</i>																		
1	Gregg.....			2											1		1	
2	Turner (red).....		1	1			1											
3	Reliance (red).....																2	
4	Cuthbert (red).....																3	
CURRENANTS.																		
1	Large Red Dutch.....		1								1	1					1	
2	White Grape.....		2															
GOOSEBERRIES.																		
1	Houghton.....	1	1	2	1		1	1		1	2	1	1	2	1		1	
2	Downing.....			1							2	2						
3	Smith's Improved.....	2																
4	Mountain.....													3				
5	Pale Red.....						2							1				
STRAWBERRIES.																		
<i>Early.</i>																		
1	Crescent.....				1				1			1					1	
2	Chas. Downing.....												1		1			
3	Wilson's Albany.....		1	1														
4	Crystal City.....	1																
5	Bidwell.....												2					
6	Metcalf.....						1											
7	Capt. Jack.....					1												
8	Cumberland Triumph.....																2	
<i>Medium.</i>																		
1	Chas. Downing.....		1	1	1		2	1			3						1	
2	Crescent.....	1						1							3			
3	Capt. Jack.....		2		2						1							
4	Wilson's Albany.....					1					2				2			
5	Cumberland Triumph.....														1			
6	President (Wilder?).....																	
7	Warder.....												1					
8	Sharpless.....																2	
9	Truitt's Surprise.....												2					
10	President Lincoln.....			2														
11	Downer's Prolific.....																	
12	Windsor Chief.....		3															
<i>Late.</i>																		
1	Kentucky.....				1			1			1				1			
2	Sharpless.....	1						2										
3	Champion.....					4							1				2	
4	Glendale.....																1	
5	Windsor Chief.....							1										
6	Golden Defiance.....																3	
7	Downer's Prolific.....		1															

